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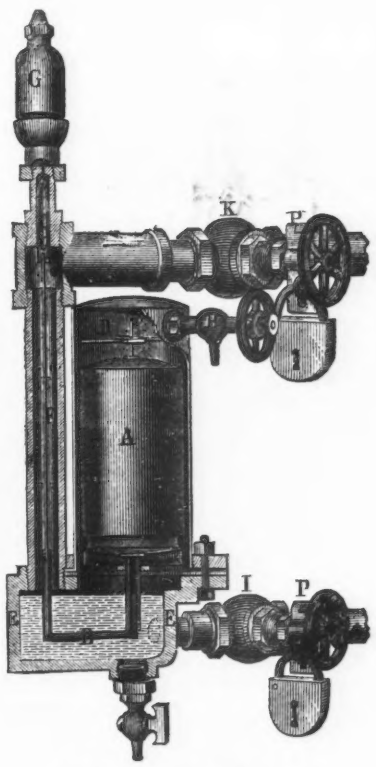
Low Water Indicator.

THE engineer should be able to ascertain at any moment the exact position of the water surface in the boiler; and this object is attained with more or less completeness by the use of the water-gauge and cocks. But, after all, these contrivances do not provide against possible negligence on the part of those to whom this important duty is entrusted; and various devices have been contrived, to secure an automatic alarm, which shall give timely notice in advance of the approach of danger from low water. Doubtless, many of our readers may recollect seeing, at the recent Fair of the American Institute, NEYNABER'S Monitor Indicator for Steam Boilers, of which the accompanying cut is an illustration. This indicator has received high praise from competent authorities, and given satisfaction in practice. It gives the alarm by blowing a steam whistle, when the water sinks to the danger line; and another whistle, attached to the safety-valve, affords notice of excessive pressure of steam. The following explanations will serve to make clear the construction and operation of this apparatus. A is the float, weighing about two and a half pounds, and connected by means of the U rod, B, with the valve, C, in the throat of the low water whistle, G. The cylinder, D, encloses the float. The water rises from E, (which is connected with the water in the boiler through the coupling, I, having a padlocked stop-valve, P,) into the cylinder, and the water-gauge, F, in which latter the water is always at the same level as that in the boiler. The gauge-cock, H, serves to show the pressure of steam in D. The steam connection, K, is of larger diameter than the water connection, L; hence, the water from the boiler will never rise to touch the valve, C, and the low water whistle, G, will therefore never blow out water with the steam, a common source of inconvenience with some indicators. To the safety-valve, L, is attached the high steam whistle, M. The hand near E, in the cut, shows the line at which the indicator is set, and to which the water in the boiler sinks before the alarm is given. The operation of this apparatus is as follows; As soon as the water in the boiler evaporates to the point at which the indicator is set to give alarm, steam will enter through K, F, and E, into the cylinder, D, the water therein descend, the float, A, fall, which will open the valve, C, and allow the steam to escape, blowing the alarm whistle, G; the gauge-cock, H, will show steam as soon as the water falls to the point of indication. and steam enters through E into D at the same time when the whistle blows. The high steam whistle will give alarm as soon as the pressure of steam gets above the point at which the weight is set, and the water-gauge will show the stand of water between low and high water line.

In examining this arrangement, a question naturally suggests itself with regard to the manner in which the essential valve, C, is operated. This valve is kept shut by the pressure of the steam from K, which is the same as that in the boiler. Suppose we have one hundred pounds of pressure in the boiler, the opening of plunge-valve, C, representing an eighth of a square inch, it would require a weight of twelve and a half pounds to open the plunge-valve, C; how is it that a float weighing about two pounds and a half actually opens the valve, C? In reply to this, Mr. NEYNABER says that, as soon as the water falls to the point of indication, steam enters cylinder, D, the water therein partly descends, and is partly transformed into steam, by which a pressure in the cylinder is produced, which differs for a moment from the pressure in the boiler, varying from a lower to a higher pressure, as can be noticed by a vibration of the pointer of a steam-guage, applied directly to the cylinder of the indicator; and as soon as the pressure in the cylinder changes from the lower to a higher degree, the float is pressed down, and valve C, being connected with the float by means of the U rod, is opened. The difference of pressure in the cylinder is immediately equalized to the amount of pressure in the boiler, but before this takes place the float will have been forced down, and the valve, C, opened. The effect of the steam entering cylinder, D, is made still more powerful by the air contained in the upper part of cylinder, D, above the guage-cock, H. As soon as the temperature increases, the air expands, producing suddenly an increase of pressure in the cylinder. It is also claimed that, when the steam enters the cylinder, D, and mixes with the water therein, a certain shaking of the float takes place, which is favorable to the operation of the indicator, so as always to open the valves, even if the pressure of steam should be higher than it is calculated to be. Among the merits and advantages claimed for this indicator, we note the following: The point of indication never varies, and the indicator ceases to whistle as soon as the water reaches the point indicated; it does not eject any water through the whistle, and by this the valve is kept free from corrosion; it works as well with the lowest degree of pressure as with high steam, and requires no regulation at all after it is attached; it is always ready for action, and has no nut to regulate, weight to set, nor levers nor pins, to get choked up with sediment or become corroded; this indicator has couplings and stop-valves for water and steam connections, so that it can be taken off from the boiler and put on again while steam is up; moreover, by the addition of the proper length of brass tubing, the alarm whistle can be put up in any part of the building; in the case of foaming of the water, the alarm is given as soon as the water leaves the point of indication, no matter how much foam is above. As long as steam is up, there is a condensation of steam in pipe, F, and bracket, E, going on, which produces a considerable quantity of distilled water running constantly back into the boiler, and carrying along any sediment of the water of the boiler; this is very important, and constitutes a great advantage of this indicator; although it is well to open the blow-off cock, O, occasionally, as a double control, the construction and arrangement of the instrument is such as to keep its inside clean while used. The water in the glass on this indicator is always clear, being a great advantage over the ordinary glass water-guage.

The Monitor Indicator is based upon patents dated June, 1867, and November, 1868. Among the testimonials of its usefulness and effectiveness, we notice strong recommendations from Dr. MORTON, of the Franklin Institute; Mr. GROVER, Chief Inspector of Steam Boilers for New Jersey; Mr. WAPLES, Inspector for Philadelphia; and various manufacturers and others, who have employed it with satisfactory results. It is



LOW WATER INDICATOR.

manufactured and sold by the Monitor Indicator Company, A. F. W. NEYNABER, general agent, No. 425 Girard avenue, Philadelphia.

Perpetual Motion—A Wicked Machine.

OUR friends who are busying themselves yet with the problem of perpetual motion, will perhaps thank us for the following simple directions for the construction of a machine which may be relied upon to run until it dries up. We find the suggestion in a valued German exchange, the *Practical Machine-builder*, of Leipzig:—

Place several small troughs, one a little higher than the other, stair-wise. Fill the lower trough with oil, and suspend over it a number of wicks, so that their upper ends shall hang over the edge of the second trough, while their lower ends dip into the oil. From the second trough a series of wicks in like manner reach up to the third, and so on. It is evident that in this way a certain amount of oil will constantly mount from the lowest to the highest trough. From the latter the oil may be allowed to flow through a pipe upon an overshot wheel, and thus to descend again into its original receptacle. The wheel will be kept in perpetual motion.

Now let the philosophers calculate for us how many wicks make a horse-power; or, if they are inclined to speculate more boldly, let them study this mysterious capillary force, which does not seem to wear out, like other agencies. Will there come a time when

> The stars are old,
> And the sun is cold,
> And gravitation will not hold,
> And fuel is worth its weight in gold,

and the universe will fall back on suction as a motive power? We don't promise to issue a weekly supplement containing the responses of the wise to these queries. In fact, though we ask the questions, it is after the manner of the orator, who would be considerably put out if anybody answered him.

Arctic Explorations.

THE San Francisco special correspondence of the New York *Star* furnishes the first account of the recent United States Astronomical Exploring Expedition up the Yukon river, in Northern Alaska, under the command of Captain CHARLES W. RAYMOND, of the Corps of Engineers. This officer, with one assistant, made his way on a trading brig, the *Commodore*, to Michaelowski, in Norton's Sound. The fur company owning the brig sent also a small iron steamer, called the *Yukon*, which was carried on the deck of the brig and launched at the mouth of the river. The expedition left San Francisco on the fifth day of April; and on the fourth of July, the ascent of the river was commenced. Twenty-one days after, with her eight inmates, the steamer arrived at Fort Yukon, a distance of 1450 miles. The trip up the river was for the most part both pleasant and interesting, though attended with many discomforts. The mosquitoes are unanimously declared to have been terrible—three times as large and ten times as voracious as the first-class gallinippers of other parts of the world. Netting constantly worn over the face is a necessary but not an adequate protection against these ferocious insects, as they bite even through the clothing. There was room on the *Yukon* for only four bunks, and to these eight men were assigned, one to each bunk—a mathematical paradox, which was solved by taking turns in sleeping. As Captain RAYMOND'S duties often required him to be on deck when it was his turn to sleep, he was frequently obliged to omit the ceremony of lying down for one or two days' running. Many Indian villages were passed, and it was amusing to see the surprise and alarm of the savages as the steamer approached. Most of them ran wildly from their villages in every direction, taking to the woods and hills for refuge.

The scenery of the river is reported to be in places very beautiful, but for the most part quite monotonous and uninteresting. By relieving each other every four hours, Captain RAYMOND and his assistant succeeded in making a complete running survey of the river for the whole distance travelled, keeping an itinerary with topographical sketches of the banks, tributaries, settlements, etc., and notes of a miscellaneous character in great quantity. Constant barometrical and astronomical observations were taken. The record of this unintermitted labor of twenty-one days and nights will be considered by all competent judges as one of which any engineer might be proud. On arriving at Fort Yukon, Captain RAYMOND immediately put up his observatories, and went to work. His instruments having been injured during the long river voyage, he repaired them himself, and on the seventh of August obtained "splendid observations" of the eclipse. Unfortunately, Fort Yukon is much further north than has been hitherto supposed, and the eclipse at this point was only partial. It gave him fine materials for the determination of longitude, however, and the results of his calculations being announced to the occupants of the post, it followed that on the ninth day of August, at twelve o'clock noon, the British flag came down, and Captain RAYMOND ran up in its place the Stars and Stripes. "Old Glory" *never floated on land so far north before.* Fort Yukon is several miles within the arctic circle, and about eighty miles on *our* side of the boundary line of British America.

Thus far all had been successful, but the return to the sea was to prove a more serious business. It was intended to remain at Fort Yukon until September 15th, but this proved impracticable, as the river freezes by the first of October, and sometimes much earlier. The plan had been to leave the steamer for trading purposes, obtain Indians and birch-bark canoes, and in that way descend the river. But only two Indians, and no canoes, could be secured, so the party set to work, Crusoe-fashion, and constructed a skiff out of drift-wood, pitching it well outside. This ricketty craft carried them nearly a thousand miles, to Anvic, where she deliberately went to pieces, like the one-horse shay. At Nulato, some two hundred miles above Anvic, the Indians left them, and as no others could be obtained, they rowed the remaining distance alone. During the whole of the return trip, which was full of wild adventure, Captain RAYMOND was accompanied only by Mr. MAJOR, his assistant, and by private MICHAEL FOLEY, a faithful and willing attendant, picked up at Sitka. At Anvic, still five hundred

miles from the sea, he found that he could obtain at the little trading station neither Indian guides nor a suitable boat. Greatly embarrassed by the situation, he called together some of the principal natives and questioned them. Anvic lies at the junction with the Yukon of the Anvic river, a tributary which rises in the coast mountains and flows inland—first north, then east, then south. The Indians said that they often ascended this river in the summer, with canoes, to a point on its northerly course where it is only separated from the coast by a single range of mountains, which they could then cross to the post of Ikikik-toik, opposite Michaelowski. Mr. CLARK, the Superintendent at Anvic, would not advise the attempt of this route, being unacquainted with that part of the country, and fearing the lateness of the season; but gallantly volunteered to accompany Captain RAYMOND, when the latter decided that, since he could not descend the Yukon further, he would ascend the Anvic, and attempt the passage of the mountains. This river is very swift and shallow. The party, pushing their canoes with poles, were not able to advance more than ten or twelve miles a day. At the end of the fifth day, the river had fallen rapidly, so that it would no longer float even a canoe. They were on the southerly course of the river, and had not yet passed around its great bend. They could go back to Anvic and wait a few months, or they could leave the river and strike westward towards the sea, crossing three ranges of mountains, the upper Anvic and two other streams, with whatever other unknown obstacles might present themselves. No one wanted to go back, and the young leader declared that at all events he would not return to Anvic, where he had already found further progress down the Yukon impossible. The chief of a neighboring village was consulted as to the feasibility of the direct across-country route, and replied that it might be possible, but that no one, either white man or Indian, had ever performed it. The loss of a large quantity of provisions added to the difficulties of the situation, and reduced the party to the necessity of living on fish. In this state of affairs, Mr. CLARK again declined to give advice, but said he would follow wherever Captain RAYMOND would lead. Captain RAYMOND seems to be one of those who will lead whether anybody will follow or not, and without more ado the little party turned its back upon the Indians and the river, and plunged into the wilderness.

The experience of the next five days is neither to be reckoned in time nor distance. When men are starving, seconds are weeks and inches miles. Readers of the early Spanish chronicles may recollect the nature of the country through which some of the South American expeditions cut their way. KINGSLEY has well described it in "Amyas Leigh," and the Arctic Zone seems to parallel the tropics in the production of a frightful, all but impassable, wilderness. The whole country traversed by this party on its last bold transit, consists of swamps, stagnant pools and jungle. The swamps occur even on the top of the mountains. They crossed three mountain ranges and three streams. Progress was rendered still more slow and difficult by the moss which covers the whole surface, everywhere, more than a foot in depth. Staggering and wading, often without food, through this horrible country, they passed five days and nights. On the night they arrived at the second crossing of the Anvic, FOLEY had to be left all night on the hills, as he was too weak to reach the river, and the rest were too weak to bring him down until the next day. Fortunately they found here some Indian hunters with plenty of food; but Captain RAYMOND was too faint to eat, and as soon as he reached their camp fell to vomiting violently. But, not to prolong this description of sufferings now happily over, the whole party, alive, though scarcely more than alive, reached the Esquamaux village of Ikikik-toik, on the coast, about twenty miles from Michaelowski. The natives were all away hunting, but word was somehow got to Michaelowski, where the *Commodore* still lay, waiting for the party to emerge from the mouth of the Yukon. The captain of the brig immediately sent over a whale-boat with food, and by midnight on the sixth of October the wanderers were again on board. Captain RAYMOND was unable to walk for weeks, and the rest were almost equally worn out. A tedious and stormy voyage of forty days brought them to San Francisco.

The Geology of the Lands Lying West of the Mississippi.

Abstract of a Communication of Professor A. R. ROESSLER to the New York Liberal Club.

IT is not surprising that even the broader features of the geology of the lands lying west of the Mississippi, and east and west of the Rocky Mountains, should at first have been misconceived, and that authoritative publications should have spread before the public statements of a character entirely illusive—that MACLURE should have marked the whole expanse as Secondary, that MARCOU should declare it to be Triassic, and that the best explorers of the present time should be contending whether the Tertiary, the Cretaceous, or the Carboniferous predominates. Crossed by only a few lines of traffic, infested with bands of hostile Indians, and remote from the means and facilities of scientific investigation, this region was studied at disadvantage; the facts were slow in accumulating, and deductions naturally took the hue of the prevailing theory in the mind of each explorer. But now the geologist enjoys larger liberty, and the results of his wanderings and investigations show that the immense regions alluded to are likely to furnish problems for solution of deep and varied interest, involving not merely the formation of one vast deposit, all-prevailing and unchanging, but that of a series of deposits, reaching from the lowest to the highest mark in geological time, and on a scale equally gigantic with all the other phenomena of the North American continent. The deposits are of all ages, both fresh-water, marine, and igneous in character; and their sedimentary rocks are crowded with the remains of plants and animals. Recent discoveries in the southern part of the basin disclose areas of territory, filled with the remains of mammalia and reptiles similar to those which excited so much wonder from the Mauvaises-terres in the North; and recently the museum of the Philadelphia Academy of Science has received from Kansas the skeleton of a huge saurian, whose length, as estimated from the parts of the vertebræ in possession, must have been but little short of seventy feet.

The interest of the geologists of the world may be expected hereafter to be attracted from the limited fields of research in Europe which once filled the public mind with wonder, to these vast basins of the West, the bottoms of the great Tertiary and Cretaceous seas, where science will discover new facts, and form new conclusions, relative to organic life on the globe.

The numerous divisions into which these strata have been arranged, in accordance with the predominance of certain fossils enclosed within them, are of the highest interest to the palæontologist; but a detailed account of them would be out of place in this outline. It may suffice to state that the broad plains intervening between the basin of the Mississippi river and the Rocky Mountains exhibit to explorers, in one part or another, on this long line of travel, vast spaces covered by the Tertiary, Cretaceous, Jurassic, Triassic, and Carboniferous, among the sedimentary rocks; and, when he climbs the impending masses on the mountain sides, he crosses, in quick succession, formations older still, encountering in turn the Permian, the Silurian, and all the forms of metamorphic azoic rocks. Their upturned edges show they have been thrown into a vertical position by the granites, porphyries, basalts, and other igneous rocks, which form the main central body of the great chain of mountains stretching from near the mouth of McKenzie river in the north, to the basin of the Gulf of Mexico. Once across this dividing ridge, and fairly in the great basin which reaches to the Sierra Nevada, the naturalist beholds a recurrence of similar deposits, and the conviction forces itself upon him that the two basins east and west of the mountains once formed the bed of a sea, in which the more recent strata now constituting the surface were slowly deposited, and that the latter have been lifted by the upheaval of the mountain system, and thus forced asunder.

To this upheaval are we indebted for the magnificent system of river drainage, and the vast plains ready for the agriculturist; but, above all, the fiery forces from below have penetrated the flanks of the mountains with veins, bearing precious metals, now newly discovered, and promising remuneration to the laboring man, profits to the capitalist, and wealth to the nation.

Notes from South-Western Virginia.

BY A. EILERS, MINING ENGINEER.

I.—GEOLOGICAL SKETCH.

WHEN the Messrs. ROGERS, during their geological survey of Virginia, failed to receive the means to extend their explorations to the extreme southern part of the State, a very important and, next to the salt and coal districts, perhaps the most valuable, mineral region within the boundaries of the Old Dominion, was necessarily deprived of the public notice it deserves. The counties of Wythe, Pulasky, Floyd, Carroll and Grayson, with their almost unlimited stores of iron, zinc, lead and copper, are particularly worthy of geological and mineralogical investigation, and of great interest, not alone to the scientific, but also to the economical observer. Portions of these counties the writer has had occasion to examine professionally during the past two years; and the following sketch, for which his note-book has furnished the materials, may be of value to the readers of the ENGINEERING AND MINING JOURNAL.

A glance at the map of Virginia shows that the counties above referred to are traversed in a northeast and southwest direction, by two great mountain-chains, which, rising first in Northern Vermont and New York, extend in an almost unbroken line through New Jersey, Pennsylvania, Maryland, Virginia, North Carolina, Tennessee and Georgia, and terminate in a series of low hills in Middle Alabama. The chain, with its subdivisions and spurs, reaches its greatest development and height in Virginia, North Carolina and Tennessee, and is known in those States as the Blue Ridge. The western range is designated throughout as the Alleghanies. The intervening depression forms in Virginia the renowned "Valley" of that State, the fertility and natural beauty of which are almost unsurpassed in the world. Between the Blue Ridge and the Alleghanies, and nearer to the former, runs a smaller mountain-chain, known in Tennessee and extreme Southwest Virginia as the Iron or Unaca mountains. Here it courses nearly parallel to the Blue Ridge, but in the northeast corner of Floyd county, Virginia, a gradual turn of the latter to the north causes the union of the two ranges. In Grayson and Carroll counties a high plateau, generally twenty-five miles wide, stretches from the summit of the eastern slope of the Blue Ridge to the western slope of the Iron mountains, beyond which is a valley, nearly thirty miles wide, separating the Iron mountains from the Alleghanies. All the waters of this region empty into New river, which, changing its original northeast course to a northwest one in Montgomery county, ultimately joins the Ohio as the Great Kanawha. Starting at the Blue Ridge and traversing Carroll or Grayson county in a northwest direction, we cross first, at right-angles to the stratification, the western portion of that wide belt of pre-Silurian rocks, which Professor EMMONS, in his survey of North Carolina, classified under the name of the Taconic System. They consist here of gneiss, often of coarse, but more frequently of fine, crystalline structure; light-colored talcose slates, mostly somewhat gritty, sometimes however approaching the character of pure soap-stone; dark green and bluish chloritic slates; yellow and blue argillaceous slates; dark hornblendic slates, presenting in some localities nearly homogeneous, but oftener coarse crystalline, masses; and extensive layers of white and reddish quartzite. The latter is, in by far the most numerous localities, compact and flinty; but in several places, especially near the western border of this series, it passes gradually into siliceous slates. Hypersthenite and augite-rock are found in one or two localities. Remarkable in these strata is a large and isolated ridge of granite in Grayson county, the highest point of which is found on Buck mountain. It has a lenticular shape, is some twenty miles long from southwest to northeast, and four to five miles broad at the widest point. A thick stratum of gneiss, coursing parallel with the other strata in a southwest and northeast direction, encircles it, running on both sides along the edges, and meeting at both ends, of the granite. The gneiss then follows, as a broad band, the course of the whole formation.

The entire series is nearly eighteen miles wide, has a general strike of north 54° east, and dips at various angles from 30° to 75° to the south-east. An exception to this general south-east dip is found in the north-east part of Grayson county, and may be seen perfectly exposed where New River breaks through the Iron mountain at right angles to the course of the strata. On this line the south-east dip is maintained from the Blue Ridge to a point, where the first large band of siliceous slates appears, about one mile south-east of the edge of the Silurian strata. Here, however, appear gradually a number of steep folds and flexures, the steepest side of the anticlinals being invariably to the north-west; and this is the only point in this region, so far as the writer's knowledge extends, where the contact of the older slates and the Potsdam sandstone is fully exposed. The latter overlies the former *conformably*.

As is most frequently the case in the older metamorphic formations, the series under discussion contains many mineral deposits, the best known of which at the present time are the "Southern lead," carrying copper and lead ores; the "Native lead," carrying metallic copper; and the "Northern lead," with its branches, the "Dalton" and "Jennings" leads, carrying, like the "Southern lead," the various ores of copper. To the north-west of the "Northern lead" occurs a stratum of syenite, containing lenticular deposits of magnetic iron ore. A belt of chloritic and siliceous slates intervenes between this and the Potsdam sandstone, which forms the entire north-western slope of the Iron mountains, here locally called Poplar Camp mountains. The formation consists of laminated quartzite, yellowish-white hard sandstone, and layers of conglomerate. The limestones, dolomites, and slates overlying the Potsdam sandstone to the north-west, occupy the whole of the valley to Walker's mountain, a sub-division of the Alleghanies. Although there are no fossils to be found in any of these strata, a comparison of their lithological character with that of the rock of the calciferous epoch of the Potsdam period in the Western States seems to justify the observer in referring them to that formation. The limestones are extremely siliceous, and some layers contain large nodules of black and white flint; the slates are red or yellow, and show cleavage joints across the stratification; the dolomites are mostly of a greyish yellow or dirty white color, and extremely hard. The contact-line between the blue limestones and dolomites is almost invariably the depository of lead, zinc, and iron ores, which in some localities have been, and still are, extensively worked. The whole series is greatly disturbed, and frequently dips at a very steep angle.

A very instructive comparison is afforded by two sections across the belt, one at a point where New River breaks through the Poplar Camp mountains, from Wilkinson's ford to the lead mines, and the other only fifteen miles further northwest, along the waters of Little Reed Island, near Wheeler's mill, thence across to New River, at Carter's ferry, and thence to Max Meadows. These sections give the following strata: Section I. Beginning on the southeast, we have, first, for one and a half miles, chloritic, clay and siliceous slates, in numerous folds, the northwest side of the anticlinals and synclinals being always the steeper, and sometimes vertical. Overlying these, with a dip to the southwest, is the Silurian sandstone and quartzite, the upper layers of which are conglomerate. The conglomerate layers, however, occupy a synclinal, those immediately over the quartzite dipping northwest, and those further northwest dipping southeast, and being apparently underlain by fine laminated sandstones. These soon resume their normal dip to the northwest, and are conformably overlain by the blue limestone, in turn underlying the dolomite, which, much contorted and folded, constitutes the banks of New River. Section II. Commencing, as before, on the southeast, we have older rocks than those first met with in the preceding section, to wit, quartzite, chloritic slates, gneiss, talcose slates, (containing the copper ores of the "Northern lead,") then a band of syenite, half a mile wide; and apparently underlying these (on account of the reversed dip,) we find the strata with which the first section began, namely, chloritic, argillaceous and siliceous slates, all dipping southeast, and beyond them the Silurian sandstone, which here appears to be overlain by the pre-Silurian rocks. The belt of the latter, which, as above mentioned, is one and a half miles wide in the first section, here has scarcely the width of one mile—a noteworthy decrease, when the short distance (fifteen miles) separating the two sections is considered. The Silurian sandstone is also considerably decreased in width, and passes, from southeast to northwest, through a strong anticlinal fold, so that the observable dip is first southeast, then curved, dome-like, covering vertical strata, then northwest. This is followed by a synclinal, so that the dip changes again to vertical, and finally to southeast, at first steep, and at last, where it overlies the more recent blue limestone, very flat. Here again, therefore, the appearance contradicts both the geological reality and the evidence of the first section, since the newer rock is

apparently overlain by the older. The limestone in the second section, nearest to the sandstone, is aluniferous. The conglomerate layers of the first section are represented in the second, so far as the writer could discover, only by a few irregular fragments. The blue limestone is broken into several anticlinals, and the dolomite is also folded, as in the first section. Beyond the New River, the dolomite continues, until it is overlain by later strata. The second section is northeast of the first, and parallel with it. The comparison of the two shows that the pre-Silurian and Silurian zones northwest of the Blue Ridge thin out towards the northeast; and this conclusion is abundantly confirmed by examinations still further in that direction upon this belt; since within, say, fifty miles of the locality just described, the Potsdam sandstone has shrunk to an insignificant stratum, or, according to Dr. CURRY'S map, disappeared altogether, leaving the Silurian limestones in immediate contact with the chloritic slates, etc., while further northeast, the limestones themselves disappear, leaving the slates in contact with the carboniferous strata.

In subsequent articles, some of the more important mineral deposits of this highly interesting region, will be described.

A Brief Account of the Processes Employed in the Assay of Gold and Silver Coins at the Mint of the United States.

(From the Annual Report of James Pollock, Director.)

PRINCIPLES OF THE OPERATION.

ACCORDING to law, the standard gold of the United States is so constituted that in 1000 parts by weight 900 shall be of pure gold, and 100 of an alloy composed of copper and silver. The process of assay requires that the copper and silver be both entirely removed from the gold; and to effect this, two separate operations are necessary. The first is for the removal of the copper; and this is done by a method called *cupellation*, which is conducted in an assay furnace in a cupel composed of calcined bones. To the other metals, lead is added; this metal possesses the properties of oxidizing and vitrifying under the action of heat, of promoting at the same time the oxidation of the copper and other base metals, and of drawing with it into the pores of the cupel of the whole of these metals, so as to separate entirely this part of the alloy, and to leave behind the gold and silver only. The separation of the silver from the gold is effected by a process founded on the property possessed of nitric acid of dissolving silver without acting upon gold. But that the gold may not protect the silver from this action, sufficient silver must first be added to make it at least two-thirds of the mass. The process to be described is based upon the rule of *quartation*, in which the proportion of silver is three-fourths.

PROCESS OF ASSAY.

The reserved gold coins are placed in a black-lead crucible, and covered with borax to assist the fluxing and to prevent oxidation of the copper alloy. They are thus melted down and stirred; by which a complete mixture is effected, so that an assay piece may be taken from any part of the bar cast out. The piece taken for this purpose is rolled out for convenience of cutting. It is then taken to an assay balance (sensible to the ten-thousandth of a half gramme or less), and from it is weighed a half gramme, which is the normal assay weight for gold, being about 7.7 grains troy. This weight is stamped 1,000; and all the lesser weights (afterwards brought into requisition), are decimal divisions of this weight, down to one ten thousandth part.

Silver is next weighed out for the quartation; and as the assay-piece, if standard, should contain 900 thousandths of gold, there must be three times this weight, or 2,700 thousandths of silver; and this is accordingly the quantity used. It is true that there is already some silver in the alloy, but a little excess over the quantity required for the quartation does no injury to the process. The lead used for the cupellation is kept prepared in thin sheets, cut into square pieces, which should each weigh about ten times as much as the gold under assay. The lead is now rolled into the form of a hollow cone; and into this are introduced the assay gold and the quartation silver, when the lead is closed round them and pressed into a ball. The furnace having been properly heated, and the cupels placed in it and brought to the same temperature, the leaden ball, with its contents, is put into one of the cupels, the furnace closed, and the operation allowed to proceed until all agitation is ceased to be observed in the melted metal and its surface has become bright. This is an indication that the whole of the base metals have been converted into oxides and absorbed by the cupel. The cupellation being thus finished, the metal has allowed to cool slowly, and the disk or *button* which it forms is detached from the cupel. The button is then flattened by a hammer; is annealed by bringing it to a red heat; is laminated by passing it between rollers; is again annealed; and is rolled loosely into a spiral or coil called a *cornet*. It is now ready for the process of quartation.

For this purpose it is introduced into a matrass containing about 1¼ ounces of nitric acid at 22 deg. of Baumé's hydrometer, and in this acid it is boiled for 10 minutes, as indicated by a sand-glass. The acid is then poured off, and three-fourths of an ounce of stronger acid, at 32 deg., is substituted for it, in which the gold is boiled for 10 minutes. This second acid is then poured off, and another equal charge of acid of the same strength is introduced, in which the gold is kept for 10 minutes longer. It is then presumed that the whole of the silver has been removed, and the gold is taken out, washed in pure water, and exposed in a crucible, to a red heat, for the purpose of drying, strengthening, and annealing it. Lastly, the cornet of fine gold thus formed is placed in the assay balance, and the number of thousandths which it weighs expresses the fineness of the gold assayed, in thousandths.

TEST ASSAY.

To test the accuracy of this process, the following method is employed:

A roll of gold, of absolute purity, which has been kept under the seal of the chairman of the assay commissioners, is opened in their presence, and from it is taken the weight of 900 parts. To this are added 75 of copper and 25 of silver, so as to form, with the gold, a weight of 1000 parts of the exact legal standard. This is passed through the same process of assay as the other gold, and at the same time. After the assay is finished, it is evident that the pure gold remaining ought to weigh exactly 900. If, however, from any cause, it be found to differ from this weight, and therefore to require a correction, it is assumed that the same correction must be made in other assays, and this is done accordingly.

SILVER COINS—PRINCIPLES OF THE OPERATION.

The standard silver of the United States is so constituted that of 1000 parts by weight 900 shall be of pure silver, and 100 of copper. The process of assay requires that the exact proportion of silver in a given weight of the compound be ascertained, and this is done by a method called the *humid assay*, which may be explained as follows:

The silver and copper may both be entirely dissolved in nitric acid; and if to a solution thus made another of common salt in water be added, the silver will be precipitated in the form of a white powder, which is an insoluble chloride, while the copper will remain unaffected. Now it has been ascertained that 100 parts by weight of pure salt will convert into chloride of silver just 184.25 parts of pure silver; consequently the quantity of salt necessary to convert into chloride 1,000 parts of silver is 542.74, as found by the proportion:

184.25 : 100 : : 1000 : 542.74.

A standard solution of salt is accordingly so prepared as that a given measure (the French decilitre) shall contain 542.74 thousandths of a gram of salt. The normal weight employed for silver assays in the gram (equal to about 15.4 troy grains), which is marked 1000, and has its subdivisions, in practical weighings, to the half or quarter thousandth. Besides this standard solution, which effects the main precipitation of chloride of silver, there is a decimal solution, of one-tenth the proportion of salt, which is expedient to use for the lesser and final precipitations. In the mode of assay under consideration, it is necessary that the portion of alloyed silver used shall contain as nearly as may be 1000 parts of pure silver. The rigid standard requires that of 1000 parts by weight 900 shall be of pure silver; but the law allows a variation from this ratio, provided that it do not exceed three thousandths. The fineness may, therefore, be as low as 897, and as high as 903. In the practice of the assay, it is found most convenient to assume the lower extreme. Now, the weight of metal of the fineness of 807, which would contain 1,000 parts of silver, is 1114.83, as found by the proportion:

897 : 1000 : : 1000 : 1114.83,

The nearest integer to this number is employed, and the weight of metal taken for the assay is 1115.

PROCESS OF ASSAY.

The reserved silver coins are melted together in a black-lead crucible, with the addition of fine charcoal within the pot, to prevent oxidation, and to allow of dipping out. After stirring, a small portion of the fluid metal is poured quickly into water, producing a *granulation*, from which the portion for assay is taken. As this differs from the mode pursued with gold, it must be specially noted that in the case of silver alloyed with copper there is a separation, to a greater or less degree, between the two metals in the act of gradual solidification. Thus an ingot cooled in a mould, or any single coin cut of such ingot, though really 900 thousandths fine on the average, will show such variations, according to the place of cutting, as might even exceed the limits allowed by law. This fact has been established by many experiments, both in this mint and the mint of Paris, since the enactment of our mint law; and it possesses the stubbornness of a law of chemistry. But the sudden chill produced by throwing the liquid metal into water yields a granulation of entirely homogeneous mixture, and it can be proved that the same fineness results, whether by assaying a single granule, or part of one, or a number together. From this sample the weight of 1,115 thousandths is taken, which is dissolved in a glass bottle with nitric acid.

Into this solution the large pipette-full of standard solution of salt is introduced, and it produces immediately a white precipitate, which is chloride of silver, and which contains, of the metallic silver, 1000 parts. To make this chloride subside to the bottom of the vessel and leave the liquid clear, it is necessary that it be violently shaken in the bottle; and this is accordingly done by a mechanical arrangement, for the necessary time. Unless the coins have chanced to be below the allowable limit of standard, the liquid will still contain silver in solution, and accordingly a portion of the decimal solution is introduced from the small pipette, capable of precipitating a thousandth of silver, and a white cloud of chloride will show itself. More doses are added if the indications require it.

The liquid is again shaken and cleared; and the process is thus repeated until the addition of the salt water shows only a faint trace of chloride below the upper surface of the liquid. Let us suppose, for the sake of an example, that three measures of the decimal solution have been used with effect. This will show that the 1115 parts of the coin contained 1003 of pure silver; and thus the proportion of pure silver in the whole alloyed metal is ascertained.

TEST ASSAY.

For the foregoing process to be exact, it is necessary that the saline solution be of the true standard strength, or be such that the quantity of it, measured in the large pipette, shall be just sufficient to precipitate 1000 parts of silver. This cannot be assumed without proof, and a test assay is accordingly made as follows:

A roll of silver, known to be of absolute purity, is kept from year to year, in an envelope, under the seal of the chairman of the assay commissioners. This being opened in their presence, a portion of the silver is taken, and 1004 parts carefully weighed off, and submitted to the process of assay described above. If the salt water used be of the exact standard, it is evident that as the solution in the larger pipette will precipitate 1,000 parts of silver, four measures of the decimal solution will be required to precipitate the remaining four parts. But as the normal or standard solution is affected, from day to day, by changes of temperature, or other influences, the finishing decimal doses may be more or fewer; and the other assays are to be corrected by the proof-piece accordingly.

CALCULATION OF FINENESS.

By the assay thus corrected, the number of parts of silver contained in 1115 of the metal under trial is ascertained; and the fineness, in thousandths, is then found by the proportion: As 1115 is to the number of parts of fine silver, so is 1000 to the fineness of the alloyed silver, in thousandths. Thus, if the assay show the presence 1005½ parts of fine silver, the fineness of the alloyed silver will be 901.8 thousandths, as found by the proportion—

1115 : 1005.5 : : 1000 : 901.79.

It is on this principle that the following table is constructed. The numbers at the top and the fractions at the side correspond to the measures of the decimal solution used, corrected by the test assay. The numbers in the body of the table show the corresponding fineness of the assay-piece, of which the weight was 1115 parts:

	0	1	2	3	4	5	6
0	896.9	897.7	898.6	899.6	900.4	901.3	902.2
¼	897.1	898.0	898.9	899.8	900.7	901.6	902.5
½	897.3	898.2	899.1	900.0	900.9	901.8	902.7
¾	897.5	898.4	899.3	900.2	901.1	902.0	902.9

In the testing of single pieces, it is to be expected that any gold coin, or a cut from any part thereof, will conform faithfully to the bounds prescribed by law. But the silver coins, in addition to the source of error already pointed out, (the manner of taking assay samples), are somewhat liable to show too high a result, from several causes. At certain grades of alloy, and especially the standard of 900, the gradual cooling of ingots will draw the better metal to the interior, and the worst towards the exterior and the edges. Hence, the fineness of pieces cut off the central part of the ingot is higher than the average fineness of the ingot. Again, in casting ingots from a melting-pot the exposure of the metal to the air during all the time of dipping out, and at the same time the increase of heat towards the bottom of the pot, unavoidably produces a progressive refining, so that the lower ingot is of a higher quality than the average of the whole melt; and, of course, a coin cut from it will be higher still. Yet, with the precautions observed, our silver coins should very rarely exceed the superior limit assigned by law; and there is no good reason why they should fall below the legal limit, unless it be the taking of an unfair sample for assay.

What to Do with our Coal Miners.

AN able article on this head appears in the *American Exchange and Review*, a periodical in which we are glad to notice a new and vigorous management. We condense the article for our columns.

"In a country like ours one must expect to be continually stumbling upon some subject of great importance, but little understood and less cared for. Social phenomena with us are so common that they hardly attract our passing attention, and questions and conditions whose exigency would thrill a Frenchman with horror are abandoned by us with the easiest carelessness to the chance of accidental solution.

"Perhaps no one question, however, exceeds in general interest, as well as intrinsic importance, the relations of different classes in any given community, one with another. Apart from the change wrought by mere natural growth in any given class, and the disturbing influence upon it of those ever-recurring revolutions in the thoughts and feelings of mankind, the alterations in its condition arising from different occupations, climatical influences, habits of life, and a thousand other secondary causes, combine to make it no trifling task to definitively adjust its relations with any other class of society.

"In this country the principles of free government, applied or, as is too common, misapplied, lend their aid in the complication of a problem none too easily understood in its simplest form.

"More distinctly felt, however, is the difficulty of defining the status of those classes of population which, from their occupation and the character of their members, are segregated or set apart from the others; and of all these classes, the coal mining part of our population is most singular and separate.

"It is almost impossible to realize the importance of the class without looking for a moment at its work; and not only the work that it has done, but that which is still undone. The great State of Pennsylvania sent to market in the year 1868 13,405,016 tons of anthracite coal, and the total coal production of the United States for the same year probably exceeded 29,000,000 tons. The area of the coal reserve in Pennsylvania, from which seventy-seven per centum of our present supply comes, is 15,437 square miles, or 9,879,600 square acres. The coal reserves of Virginia and Illinois taken together are more than four times as great; and those of all the States in which coal is known to exist are estimated at 133,132 square miles, or 85,204,480 square acres.

"Pennsylvania has mined from her 9,000,000 square acres about 171,500,000 tons. All the rest of this vast expanse of mineral wealth is almost literally untouched. The gigantic trade that has been born of this industry is not yet forty years old, and for the most part, so far as the capital actually used in mining operations is concerned, is confined to Pennsylvania. But at no distant day the resources of other States must be called into action; and whenever that comes to pass, the

question—What shall we do with our miners? will extend itself beyond Pennsylvania. Indeed, as Eastern and English capital is already so largely invested in the coal trade of that State and the railroads built in its development, the interest of the problem is not confined within any merely geographical limits. We are, as a nation, becoming the great coal centre of the world. Already it is one of our most colossal resources, and the commerce that is built upon it and the manufacturing interests dependent upon it, make the coal trade a subject of national importance, and the question indicated as the title of this article one of general moment.

"The first and most immediate difficulty is the government of the miners. As a class, the condition prevalent among them is perhaps without a parallel in any other portion of our population. Coming to us from the agricultural chain-gangs of England, or the undisciplined peasantry of Ireland, they find themselves in a new and unimagined phase of existence, with plenty where they had grown used to famine, and freedom where they were accustomed to arbitrary and severe restraint. With the distinction between liberty and license all unlearned, the habit of resistance to law, simply as law and without regard to its rightfulness, strong upon them, and with it the flush and extravagance accompanying the possession of unaccustomed power, it can be scarcely wondered at if they rush into all the excesses of unreflecting ignorance. If a superintendent is unpopular, why should they not shoot him? or rather, as they usually shoot first, what harm is done if he be shot? There is no scheme for the removal of unpopular officers more popular or in more general use than this. The detection of the particular offender is impossible in a community where every man is an accessory before the fact. In like manner, the sense of obligation, as distinct from mere impulsive generosity, for which they are remarkable, is repudiated. It is now quite a common regulation amongst the mining stores, which are generally in the ownership of the company operating the mine, and are the only places where the miners can procure the ordinary necessities of life—groceries, furniture, clothes, etc.—to require from every man purchasing any article, even of the most trifling value, an order from the proper officer of the company for a credit of a designated amount. This order is then presented on pay-day by the keeper of the store, who usually draws nine-tenths of the miner's whole pay. The adoption of this plan, or one of similar design, arose from the difficulty of inducing the miners to pay their bills out of their wages; and the fact that the retention by the company of whatever amount the store-keeper reported as standing against a miner, was thought by him to be a direct swindle. But even the plan sketched, although understood by them, is so much disliked that at one or two mines they burned the stores and compelled a discontinuance of the system. Much of the trouble no doubt arises from the management of their domestic life. After a miner has received his pay, and spent a large proportion of it in some reckless frolic, he turns it over to his wife, who wastes her fair share. Whatever pittance remains is devoted to household uses, but in a manner so wildly extravagant and foolish that nothing but pity represses one's ridicule. It is so rare to see the faintest attempt at neatness in a miner's house that it is hardly worth while to notice the exceptions to the universal squalor and wretchedness. To the few settlements of the Welsh, scattered throughout the anthracite region, what we have said is hardly applicable; but the picture is generally more distressing than we have drawn it. * * *

"Since the recent war, and the consequent increase in the demand for coal, the difficulty has been more pressing. As experience convinced them of their comparative immunity from law, and as the rise in the value of coal showed them their importance to the capital invested in the trade, the miners of Pennsylvania began to take high ground and endeavored to enforce their demands by the threat, and not infrequently the actual commission, of outrages upon the persons and property of their employers.

"A single incident, and that not an unusual one, will show the character of these outrages more perfectly than any general description. On one of the great railroads leading from Wilkesbarre—the centre of the Wyoming coal field—there is a very heavy down-grade encountered in running from the top of the eastward range of the hills enclosing the valley to the town below. The roadway is cut in the side of the mountain down which it runs, and is very dangerous in the abruptness of its curves. The famous road over the Mont Cenis is hardly more remarkable for daring engineering, and the peril to which the traveller is exposed is not so great, since in the Pennsylvania road the centre rail with the side wheels is not in use. During the recent strike, and while there existed among the miners a feeling of great bitterness against this particular road, the engineer of a passenger train going northward started his engine down the mountain; just as he approached the heaviest portion of the grade, he noticed some obstruction on the track; stopping his engine and whistling the breaks down, he decreased the speed of the train so much that when it struck the object, which proved to be a tie thrown crosswise upon the rails, it was with too little force to be thrown from the track. Being somewhat alarmed by this escape, he moved the train as slowly as possible, and to this caution the passengers owe their deliverance from a terrible death; for just at the most dangerous point in the entire descent, where the road makes a sudden curve from left to right, with a precipice on the side towards which the road runs, several hundreds of feet deep and with a mere hand's-breadth of spare room, had been placed a series of heavy ties, so firmly spiked and secured that no engine could possibly have thrown them off. Had the train struck them at even half the usual speed, no earthly power could have stayed its fall over the precipice. The time as well as the place had been chosen with the most careful judgment, and nothing but the accidental mistake in leaving the loose tie higher up the mountain frustrated the design."

After briefly suggesting some measures of education for miners' children, and the enforcement of sanitary regulations, and other means of advancing this class in civilization and refinement, the writer remarks that, "behind the questions at which this article has glanced rests, as yet untouched, the great problem of the adjustment of the relations of the mining population, as forming one of the laboring classes, with the employing capital. We shall for the present leave this subject, partly because our allotted space is well-nigh exhausted, partly because the proper formula of the question supposes that the laboring class shall be in its normal condition. Until that condition shall be reached by the mining class, its relations with the capital by which it is employed must necessarily remain artificial and unnaturally harsh, and the discussion of those relations correspondingly limited and incomplete.

"The evil of permitting the great transporters of coal to be the actual owners of the mining operations is not felt by the miners, except so far as the disturbance of the true principles of trade is concerned.

"Whether or not the aggregation of capital in the hands of powerful corporations is beneficial to commerce, is rather a doubtful point, although, in our ready appreciation of the evils of the system, we are somewhat given to overlooking its advantages. However that may be, the present tendency is so markedly in the direction of organized effort with accumulated capital, that we can safely consider the existing condition of things as a fixed term in the problem of what we shall do with our coal miners. And it is to this feature of our mining system, as at present developed, that we must look for a solution of the question. It is quite possible for the great coal roads and companies of the Wyoming and Lehigh regions to effect what is impossible to the small operators of the Schuylkill. If the former could be induced to co-operate in a general plan for the strict government of the miners in their employ, and some intelligent scheme for bettering the physical conditions and educating the children of these miners, the problem would ere long be solved. Nor would it be necessary to overstep the usual forms of the law in the accomplishment of some such design. A little extra legislation, of a higher grade of intelligence perhaps than that to which the last session accustomed us, enforced by a powerful local police, would do the work."

MINING SUMMARY.

Nevada.

SILVER PARK.

The *Inland Empire*, of Nov. 5, says this new mining district promises to be a splendid rival of Treasure Hill. From Mr. E. R. Shimmin, a gentleman well known in Western Nevada as a man of perfect reliability, it obtained the following items: "The district is one hundred miles from Hamilton, nearly east, and twenty-five miles southeast of Patterson. The mines are in a low range of hills, between the Shell Creek or Patterson and Shoshone ranges. The mountains run southwest and northeast, and the country rock is porphyry. In this porphyry range two hills or buttes rise up, and in these buttes the mines are found. In the one first approached from the Patterson side, called Quartz Hill, there seems to have been a great outburst of quartz, extending across and at right angles of the range for forty rods, and rich in silver. In the second, or Mineral Hill, the ore has been thrown up through the hill in a thousand jets, and indeed the whole hill-cap is almost one body of ore, and much of it very rich in silver. It seems all the quartz is found in lime, which in turn is surrounded on every side with porphyry; altogether, making the strangest formation ever seen in any country. Some of the ore brought in is scarcely distinguishable from first-class Eberhardt; and though the district is small, being not more than one and three-quarter miles in length, by a quarter in width, the fortunate owners are all millionaires—in expectation. Some hundred claims have been taken up, among which the Silver Star, Hasseyampa, Miner's Dream, Mineral Hill, Savage, Eureka, John Stormet and Nevada Queen are the most prominent. The Nevada Queen, with a cut of twenty-five feet, reveals a solid body of ore eight feet in width, every pound of which is rich milling ore. There has not been much work done, as the district was discovered only on the 7th of last month. The country is described as a beautiful place in which to live, much lower in altitude than White Pine, with plenty of grass, wood and water convenient. Next summer will see a lively camp at Silver Park."

MESMERIC MINING.

We copy the following from the *Inland Empire* of October 30: "The Munro Mutual Mining and Tunneling Company is a New York institution whose members are all spiritualists. Several acres of the flat near Eberhardt city comprise the mining property of the concern. The operations of the company are directed by Madam Munro, a clairvoyant, who professes to tell exactly where the "pay grit" is to be found. Capital stock of the institution $10,000,000, of which amount $3,333,333.33⅓ have been set apart as a working fund. J. L. Bigler is the Superintendent of the company, and has been vigorously working the claim for several months. He has a shaft down some sixty or seventy feet, and yesterday it was reported that he had struck a fine body of good ore. Madam Munro is consulted daily while in a clairvoyant state, and her instructions immediately telegraphed to Superintendent Bigler. Of late most of the dispatches have read: "All right; go ahead." Among the faithful the stock has recently gone up to $32.50; so says Bigler. The President of the company, a Mr. Nelson, is expected to arrive here to-day. Since good ore is found almost everywhere in White Pine we should not be much surprised if the 'Munro Mutual Mining and Tunneling Company' struck it rich; but this would not materially strengthen our confidence in 'Madam Munro's' spiritual revelations, especially as relating to mining."

SALES OF WHITE PINE MINES TO EASTERN CAPITALISTS.

The *Inland Empire*, of November 2, says: J. R. Murphy, of Treasure City, is said to have sold three mines and the Murphy mill, in New York, for a round sum, but of the exact figures we are not advised. The mines alluded to are the Sunburst, near the Eberhardt, Doran, on Pogonip Flat, and the second southern extension of the Original Hidden Treasure. It is also reported that Upton has sold to parties in Chicago the Challenge and two other mines situated on Eberhardt ridge, near the Mazeppa, for $300,000. Taylor, of the Pocotillo mine, we also hear, has effected a sale to the amount of $50,000, in one of the Eastern cities, of mining property in Reveille District. We learn further that the Golden Mine was yesterday sold on the ground to Eastern capitalists, for $5,000. White Pine stocks, it would appear, are beginning to look up somewhat."

LETTER FROM COPE DISTRICT.

From a letter in the Elko *Independent*, from Mountain City, Nov. 1, we make the following extracts: "The last week has been the most stirring one since the formation of the camp; the sound of the hammer is heard in all directions, almost every one substituting comfortable frame buildings for the tents of the past. The last of the machinery for the Drew & Atchison mill has arrived on the ground, all in perfect order, not even a nut or screw missing. The boiler and engine are placed in position; the building is all covered in; all the lumber required is on the ground; mechanics in all the departments are kept constantly employed; the contractors for the wood are also delivering in advance of contract time; and everything looks better than the most sanguine had anticipated. John Atchison informs me that if necessary the mill could be made ready for crushing by the 23d instant, but in order to have all the machinery in perfect working order he will not start up before the 1st of December. The steam saw mill of Riddle, Lytle & Co., has been at work during the past week, and is turning out a good supply of superior lumber, the market price of which, delivered, is $100 per thousand feet. The mill is situated about seventeen miles from town, and the company have a sufficient supply of logs on hand to keep it running constantly all winter. Several parties are making shakes, the average price of which is about $40 per thousand. An unusual quantity of lumber and shingles have arrived from Elko lately; price, from $95 to $100 per thousand feet of lumber. The following quantity of rock has been shipped during the past ten days by Delbanco & Hughes: Fourteen tons of Argenta rock, two and a half tons of Hamilton, five tons of Belle of the West. Thomas Lynch has also shipped four tons of ore from various ledges—making in all twenty-five and a half tons, which, when heard from, will no doubt improve the financial condition of our district, in which we are all interested. Winter is gradually approaching; the nights are fearfully cold; the days moderately comfortable. The health of the community is unusually good. We have had but one death since the organization of the camp. There are but few cases of mountain fever or kindred diseases to which other mining camps are subject. A new district, known as Wyoming, about twenty miles east of this place, is creating considerable attention, and large numbers of prospectors are going out daily. The Eudora Company, located on Argenta Hill, have run a tunnel 53 feet already, and intend running it 1,200 this winter, if possible. There is every indication of striking it rich. The Argenta Company are taking out an average of three tons per day. As they go down, the ledge is getting wider and the rock is richer than heretofore. The Hamilton is also improving greatly. There is more interest manifested by miners in developing the ledges already located than has been exhibited for some time, and it is to their own welfare, in view of the hasty completion of the mill. Enright, Combs & Co.'s Express Company's stage arrives and departs with a regularity that is worthy of notice. It makes the trip in twenty hours, leaving Elko on Wednesdays and Saturdays, reaching here on Thursdays and Sundays. Six tons of ore from the Argenta mine, in Cope district, were recently viewed at Elko on the way to San Francisco for reduction. Wm. S. Canty, one of the early and fortunate men who went to Cope district, has been successful in arranging for a mill. The pans are of the Hepburn pattern, with some late valuable improvements. The mill will be erected as soon as possible."

PAHRANAGAT AND ITS MINES.

A correspondent thus writes in the *Reveille*, from Hiko, Oct. 26: "The mountains in which the Hiko Company's mines are located are nearly 9,000 feet above the sea level, and belong to the silurian age. The range has a southerly course till it strikes the Colorado river, 120 miles distant, and is composed of dolomitic limestone. Stretching along their eastern base is the Pahranagat valley, the most fertile in the State, from which the towns of Hiko, Silver Canyon and Logan receive their supplies of hay, grain and vegetables. The richness of the lime strata cannot be determined closely, for the reason that upheaval and displacement have not brought to light the underlaying rocks; sufficient displacement has occurred, however, to expose a thickness of about 1,500 feet of limestone strata varying in thickness from one to thirty feet each. The Illinois and Indiana mines are both on the great Hiko lode, which is a true fissure vein, with a strike due north and south, dipping west 95°, or but 5° from being vertical. Parallel to the vein on the east side is a dyke of quartzite, varying in thickness from 50 to 100 feet, and on the west side a dyke of porphyry of about the same thickness. The average thickness o the vein longitudinally, a distance of 10,000 feet, will average 20 feet. The company own 26,000 feet on this vein. The vein throws out shoots or spurs that, in other districts, would be called mines; many of them have large masses of high grade ores easily extracted, all of which belong to the Hiko Company. The vein is separated from the foot and hanging wall by pulpy seams of clay, the same as is found on the Comstock. A large quantity of ore is now being taken from the mines, of which we are working about 12 tons daily, averaging $100 per ton. The whole vein matter would average from $50 to $70 per ton, and can be worked by wet process, arrangements for which are being made. The quantity of ore that can be extracted can hardly be estimated. It contains chloride, sulphuret, and spangles of native silver. The mill is located at Hiko, twelve miles distant from the mines, and has a capacity of ten stamps, five furnaces, and eight pans, and is as fine a working mill as there is in the State; in fact the best I have ever started. An artesian well is under construction at the end of the tramway, some 1,500 feet from the main workings of the mine, where reduction works will be erected, approaching, as nearly as possible, the capacity of the mines. In the immediate vicinity wood for generating steam, and white pine lumber for mining and milling purposes exists in abundance. The mines are easy of approach by good natural roads from all directions. In conclusion, I will state that I consider the property of this company and other mines in the vicinity will justify one of the largest and most permanent mining camps in the State, from the fact of having a large agricultural valley within ten miles, which will always furnish cheap supplies, a mild climate—average temperature 55° the entire year—and wood for fuel in abundance. The quantity of ore the mines can furnish is considered by all who are competent judges to be inexhaustible. The district is within a short distance of the Colorado river and the proposed line of the Southern Pacific Railroad, which will afford easy access to the Atlantic and Pacific coasts."

California.

THE EUREKA MINE.

We find the following description of the above celebrated mine in a San Francisco paper. It is located near Grass Valley, in Nevada County, and is owned principally by the Messrs. Watt: "The an-

nual report of the Eureka Gold Mining Company, of Grass Valley, for the year ending September 30, 1869, is before us. In his report to the stockholders the President says: 'Last month the company obtained from the United States Government a patent for 23½ acres, covering the Eureka Lode for a length of 1,680 feet, with all its dips, angles, and variations—the procurement of the patent, although attended with considerable expense and trouble, is worth more than it cost, as the company's title is now perfect, and beyond attack from any quarter. During the past year the company have bought the Roannaise Mine (or 37-40ths of it), adjoining the Eureka on the west, and comprising 2,000 feet in length on the Eureka Lode, with all dips, angles, &c. This is thought to be an important acquisition for the future of the company, as it gives with the ground previously owned 3,680 feet on the lode, with only 1,400 feet prospected.'

"The superintendent furnishes the following particulars of the workings of the mine: 21,526 tons of quartz have been hoisted, and 20,588 tons crushed in 307½ working days, averaging 66¾ tons per day, with 30 stamps; on surface, 1,798 tons; have worked 137 tons of sulphurets, and have 70 tons on hand, valued at $10,000; have driven 1,085 feet of drifts; sunk 200 feet of winze, and 30¼ feet of the main shaft; fourth level drifts are 1,418 feet in length, and fifth level 640 feet; fourth level has produced 37,485 tons of quartz, and will yield at least 5,000 tons more; from fifth level have only drawn 1,307 tons. Main shaft is down 60 feet below the fifth level; mill has only lost 4½ working days in the year.

"The secretary shows the receipts of the company for the year to have been; From bullion account, $263,687 89; with etcs., and cash on hand at beginning of year the total is $596,048 58. Disbursements—dividends, $264,000; milling and mining account, $202,204 15; mine purchase, $45,000; with etcs., and cash on hand at end of year ($54,871 49), the balance is struck of $596,048 58. Assets are placed at $169,685; liabilities, none. The ore yielded on an average $27 80 per ton, and cost to mill and mine, $9 65.

"Since the company went into operation, October 1, 1865, to date, the receipts of the company from bullion amount to $2,152,389; costing for mining, milling, etc., $780,575, leaving a net profit of $1,387,-311. Dividends have been disbursed to the amount of $934,000.

The Grass Valley *Union*, October 20th, says: "The Eureka Mill was yesterday cleaned up, after a two weeks' run, and the proceeds sent below. The amount realized was something over $20,300, not counting sulphurets."

The *National*, October 25, says of the North Star Mine: "We understand that this mine had a clean-up on Saturday, amounting to several thousand dollars. Taking out rock will be suspended for the next eight or ten days, to put in a new 16-inch pump and an engine. The Rock from the Pittsburg Mine still looks first-rate. We saw a small specimen which was streaked with fine gold and rich in sulphurets."

MINT STATISTICS.

The deposits at the United States Branch Mint, at San Francisco, Cal., for the fiscal year ending June 30, 1869, were as follows:

GOLD DEPOSITS. U. S. Bullion.	Value.	Value.
California	$5,331,748 32	
Idaho	412,654 21	
Oregon	476,469 78	
Montana	219,609 94	
Washington	.....	
Nevada	32,463 54	
Arizona	212,557 19	
Parted from Silver	60,779 22	
Sitka	397 64	
Mexico	190 10	
		$6,747,870 84
Fine Bars	11,539,401 57	
Foreign Coin	135,501 19	
Foreign Bullion	74,029 43	
		$11,748,932 19
Total Gold		$18,496,793 03
SILVER DEPOSITS. U. S. Bullion.	Value.	Value.
California	.....	
Nevada	$17,367 27	
Arizona	.....	
Idaho	19,145 89	
Oregon	.....	
Parted from Gold	56,039 63	
		$92,552 79
Bars	204,540 27	
Foreign Coin	71,598 29	
Foreign Bullion	12,143 44	
		288,282 00
Total Silver		$380,834 78
Total Gold and Silver		$18,877,627 82

U. S. BRANCH MINT, SAN FRANCISCO, Aug. 19, 1869.

Pennsylvania.

AFFAIRS IN THE LEHIGH COAL DISTRICT.

The Mauch Chunk *Gazette*, 12th inst., says: "It is expected that the water will be let into the Lehigh Canal again on Monday. This will probably afford time for several trips before navigation closes, and together with the resumption of work in most of the idle collieries of this region, will help materially to complete the winter's supply. Last week most of the idle collieries resumed. All are now at work, except those of Messrs. Pardee & Co., at Hazleton, those of Messrs. Markle & Co., at Jeddo, and the Upper Lehigh Colliery. The terms are the same substantially as those upon which the Jeanesville men resumed recently, except that the cutting price is 55 cents instead of 57. Ten per cent. is allowed on advances in price over $5 per ton at shipping points. No new arrangement was made concerning oils, and the percentage will be computed on the whole excess over $5, including advances which may be made in tolls. These are essentially the same terms upon which an agreement was so nearly concluded in August last. It seems now, as though this agreement might just as well have been concluded then, so as not to have lost these two fine fall months; yet there were doubtless some serious obstacles in the way. Messrs. Pardee & Co. posted up hand-bills on Monday, offering to let their men resume upon the same conditions upon which the surrounding collieries are working, with a few provisos and exceptions concerning the amount of coal to a car, and the control of the work. It remains to be seen whether or not the miners will agree to these conditions; but we do not deem it probable that the 'dead-lock' there will be continued there much longer. It must be some time before work can commence again at Upper Lehigh, as the burned breaker will have to be rebuilt again. The men at Yorktown threaten to turn out Monday, the 15th, unless a person discharged by the company be reinstated."

LIGHTING THE RICHMOND COAL WHARVES.

The Philadelphia *North American* writes that the Reading Railroad Company, with the help of Prof. Morton, have been experimenting with a view of lighting up their track at the Richmond coal wharves. The results thus far have been very satisfactory. With a single oxy-hydrogen light and a good reflector they were able to illuminate the road for one mile. It is proposed to use two such burners, to be placed on high towers, which will give all the light necessary. The jets and gas reservoirs have already been ordered. The region around the coal wharves is usually in total darkness. The gas for the light is to be furnished by a New York company, lately formed, who intend to manufacture oxygen by a new process, and pump it into the reservoirs at the small cost of 5 cents per cubic foot.

OPERATIONS IN THE SHAMOKIN COAL DISTRICT.

The Shamokin *Herald* says: "The amount of coal shipped from Northumberland County for October is 111,917 tons—a small decrease on September shipments, Of the above tonnage the Shamokin region is entitled to 107,138 tons. All the operations are at work, and it is thought that the November shipments will be larger than those of the previous month. In our next statement we shall add two collieries to our list—viz., the Franklin Gowen, and the Clinton. The former is now running, shipping about 30 cars a day, and in a few days the latter will start, with a capacity of 15 cars per day.

THE PETROLEUM TRADE.

We condense from the Titusville *Herald* the following facts relative to the petroleum producing district, during the month ending October 31st: "The total production during the month under review, as shown by the difference between the stocks on the first days of October and November, and the shipments from the region during the meantime, was 405,206 barrels, of 43 gallons each, or a daily average of 13,071 barrels. This shows an increase, as compared with the daily average of September, of a little more than 400 barrels, and of 3,000 barrels over the daily average for October last year. The following table shows the production during October, the average per day, the production previously reported in 1869, and the average per day since January 1st; the product from January 1st to November 1st last year, and the average per day for the same time:

		Bbls.
Total shipment of Crude for October of bbls. of 45 gals. each		403,229
Add to reduce to bbls. of 43 gals. each		17,921
Total shipment of bbls. 43 gals. each		421,150
Stock on hand October 1st	262,419	
Stock on hand November 1st	276,475	
Deduct decrease on November 1st		15,944
Total production during October		405,206
Average per day for 31 days	13,071	
Production previously reported in 1869		3,012,232
Total production since January 1st		3,417,438
Average per day for 304 days	11,241	
Total production same time last year		3,090,566
Average per day same time last year (305 days)	10,133	
Average per day during October last year	10,130	

"THE DEVELOPMENT AND THE TERRITORY.

"Toward the close of October the development was attended with some excitement on account of a new 260 barrel green oil well, having been struck on West Pithole Creek, in the sixth sand rock, which underlies the black oil yielding rock into which most of the other wells in the vicinity were sunk. Previously, operations resulted very successfully between the tract on which the well above indicated was struck and Upper Cherry run. Several wells were struck, the yield of which ranged from fifty to eighty barrels daily, and these wells were located in such positions that they have indicated the course of the green oil belts plainly. On West Pithole Creek about ten of the wells that had been producing black oil were being drilled into the sixth sand rock, and preparations were being made to sink others into the same rock. The value of the territory on West Pithole Creek appreciated rapidly after the large producing well was struck.

"At Parker's Landing, on the Alleghany River, the development progressed satisfactorily during the month, and the territory was considerably extended. The termini of the producing territory along the river were, at the close of the month, from three to three and one-fourth miles apart, and non-producing wells had not been found at either. The width of this territory, so far as developed, ranged at the same time, from one-fourth to one-half of a mile.

"On the Great Republic Oil Company's tract, Upper Cherry run, a new 50 barrel green oil well was struck, and on West Hickory Creek, two new wells were struck, by which the producing territory was extended by about one hundred acres.

"On the whole, the development during the month was very successful, both with regard to the number of new wells struck, and to the extension of the territory."

Montana.

THE UNIONVILLE MINES.

A correspondent of the Helena *Herald*, writing from Unionville, Oct. 24, says of the different mines and mills of that district: "I will now give a brief account of the various ledges being actually worked, and the number of men each company employs, and I am sure you will be surprised to learn that so many men are engaged in ferreting out our earthy possessions. The first ledge you come to after leaving the village is the Discovery claim on the extension of the Union lode, now owned by Messrs. Hendrie & Co., who work about thirty men, and keep their new 20-stamp mill running constantly; but this is owing in a great measure to the good management of Mr. George Reynolds, who has had large experience in quartz mining, both on this and on the other side of the range. The next is the I X L Company's ground, owned by Messrs. Ricker & Price. They employ some forty men, but will increase their force during the winter. The next you reach are the works of the National Mining Company, who employ eighty men. This large force is required, from the fact that the diggings are deeper, and with more water in them than the other claims, consequently they are more liable to casualties. The mill is kept running steadily. The next is the Columbia Company, superintended by Mr. Tatem. They employ about fifty men all the year round, and may be considered the best organized company in the Territory. Thirteen wagon loads of machinery, consisting in part of engines, boilers, pumps, stamps, etc., arrived here for the use of this company, which proves that the mines thus far have paid good dividends, and that the stockholders have implicit confidence in their permanency. As you proceed over the hill towards the head of Grizzly, you reach the Parkinson lode. This lode has been lying dormant for some time past, but it has again awakened from its slumbers, and Mr. Batchelder, the foreman, informed me a few days ago that they intended to employ about sixty men during the winter season. Judge Turnley has twenty-five men to work in his mill and lode; and Mr. Sanders, agent for J. W. Whitlatch has a number of men at work on the Park. There are several other smaller companies engaged in prospecting, which would make a total of 400 men now employed in perforating mother earth in pursuit of the golden treasure."

INDIAN CREEK.

The Deer Lodge *Independent*, Oct. 30, says: "The upper portion of Indian Creek is now being prospected with more vigor than any other place we know of in the territory. The diggings are what is called "deep diggings," it being thirty to forty feet to the bed rock. Quite a number of companies are running drains, and one or two of them have struck rich ground—good for twenty dollars per day to the hand. Everybody there feels jubilant over his prospects, and anticipate a lively time next season. The town—called St. Louis—contains some thirty houses of all kinds. There are three stores, a butcher shop, blacksmith shop and feed stable. An arastra is running at the lower end of town that is said to be a complete success. Some very fine quartz lodes are situated near the town that promises largely when machinery shall have been erected for crushing. If we are not greatly mistaken, St. Louis and its immediate vicinity will ere long be recognized as among the best localities in Montana for mining. The gold is coarse, but of a very superior quality, but nearly equal to that produced at Highland."

The Helena *Gazette* is credibly informed that the St. Louis & Montana Mining and Milling Co.'s mill at Flint Creek has been rented for $21,000 for one year to a company from the Pacific coast who intend running the mill on Flint Creek ore.

West Virginia.

THE VIRGINIA COAL AND IRON COMPANY.

The Cumberland (Md.) *Alleghanian* says of the operations of this company: "We are pleased to hear that the Virginia Coal and Iron Company, of Hampshire County, West Virginia, are rapidly pushing their work to completion. The iron and spikes are all on the ground, and track-laying commenced; and it will be but a short time before we will see the black diamonds from their mine passing through our city. The mine is open, and shows a breast of coal that would do even an old miner's eyes good to witness."

Arizona.

The Prescott *Miner*, October 16th, speaking of mining affairs at Big Bug District, says: "Mr. Heslep run through and cleaned up five tons of refuse ore from the Independence Mine, which yielded $22.50 per ton in free gold. Taking the yield per ton of the first-class ore from the mine, which was worked in an arastra a short time ago by T. W. Boggs, and adding it to the result obtained by Mr. Heslep out of the small pile of ore left by Mr. Boggs, and we have an average yield of $36 per ton in free gold! Enough, we should say, to pay handsomely for working it. The company are now taking ore from two lodes, and have about seventy-five tons out, which they feel very confident will pay from $20 to $30 per ton in free gold. Some twenty men are at work at the mill and in the mines, and more will soon be engaged. New roads have been laid out, lumber to build houses for the workmen at the lodes has been ordered, and it looks as though the company meant business. Mr. Heslep has made many good improvements on the mill, and economy is the watchword of the company."

"At Walnut Grove," says the same paper, "five men at work in the cañon have struck very rich pay dirt, from which they washed out, in about half a day, two ounces of dust. Charley Gerung is working the Sutler lode, and packing about one ton of the ore per day to his arastra on the Hassayampa."

Idaho.

Mr. J. C. GEIR, Collector of Internal Revenue for Idaho, at Boise City, reports the following amounts of bullion assayed in Idaho Territory for the years 1865, 1866, 1867, and up to March 31st, 1868. Since that time no returns have been made to his office, in consequence of the tax on assayed bullion having been removed. These returns will give no idea of the gold and silver yield of Idaho, as but a very small fraction of the product of the mines is assayed in the territory. It is safe, in Mr. GEIR'S opinion, to put the yield of the precious metal of Idaho, since 1863, at an average of $12,000,000 per annum.

Amount of bullion assayed, as per United States Assessor's returns to this office, up to March 31st, 1868:

1865	$471,340.15
1866	1,615,697.85
1867	628,501.69
1868	697.066.17
Total	$3,412,605.86

Oregon.

ORO GRANDE.

The *Sentinel*, October 16th, says: "This company has struck a quartz lead in Applegate, Josephine County, that prospects well in free gold. We have some of the rock at our office, which looks rich. The vein is twelve feet wide between casings."

NEW MINES.

The Roseburg *Ensign* says: "We are informed by Mr. J. Haynes, of Curry County, that rich gulch diggings have lately been struck on the south fork of Sixes River, in Curry County, further up the stream than any mining has been before carried on."

New Mexico.

THE PROSPECTS.

The Elizabeth *Telegraph*, October 2d, says: "We have a large area of ground that will pay from six to twenty dollars a day to the hand. Seven hundred inches of water will be brought in through the large ditch, already completed, at such a height as to enable miners to use the same water six or eight times, or even oftener. Quartz lodes are not yet sufficiently developed, though many are known to be good. The only mill in operation—Maxwell's on the Aztec lode, 15 stamps—cleans up from five to seven thousand dollars every week. The discoveries recently made on Red River, eight or nine miles from here, indicate a mining field second to none on the line of the Rocky Mountains."

British Columbia.

THE CARIBOO AND KOOTENAI MINES.

The latest mining intelligence from Cariboo and Kootenai is favorable. Water is plenty, and the hydraulic claims are all at work. The claims on Williams Creek are paying well. A new quartz ledge has been discovered on Mosquito Creek. T. Allen, of the Dutch Bill Company, on Williams Creek, met with an accident from a cave in the bank, by which his leg was broken. The Dutch Bill Company cleaned up 173 ounces for four days' run. Since last April the Coombs' claim, in Stout Gulch, has yielded $50,000. Weaver Creek, Kootenai, is said to be paying from $20 to $30 per day to the hand.

Vermont.

VERMONT QUARTZ GOLD.

The first quartz gold from the Vermont gold fields, at Bridgewater, was received at the United States Assay Office, in this city (New York), on the 5th inst., and consisted of two bars, weighing 23.47 ounces before melting, and 23.46 ounces after melting, 905½ fine, valued at $439.13 gold coin.

Dakota.

SWEETWATER MINES.

THE near approach of winter has caused a cessation of much of the work in mining near South Pass and Atlantic cities, and business is therefore likely to remain at a standstill during the winter, in those places. We however look for a season of remarkable activity in mining early upon the opening of spring.

Utah.

GOOD ORE.

The Elko *Independent*, Oct. 27th, says: "On Monday Eder & Co. received 6,000 pounds of ore to ship to L. L. Robinson, San Francisco, that is supposed to be worth $18,000. The ore is from Pioche, a mining camp in Meadow Lake Valley. Pioche & Co. own several mines in that district."

MARKET REVIEW.

The Coal Trade.

NEW YORK, Nov. 19, 1869.

ANTHRACITE COALS.

WHOLESALE.—There is very little change to note in the market for the past week. Stove coal is yet scarce, while the larger sizes are in full supply. We hear of sales of stove coal to-day as high as $9 @ $9.25. Egg and chestnut are also in light supply. The market generally remains firm. The Scranton and Pittston companies as yet decline making any sales, they being full of orders for this month. The Delaware & Hudson Canal company, we understand, are open for orders on all sizes of their choice coals. These coals have for many years given entire satisfaction to the consumers, and we recommend them to the trade generally.

BITUMINOUS COALS.

The demand for Cumberland coal for manufacturing and steamer purposes remains good. The extra demand for these coals in this city has induced the George's Creek Coal & Iron Co. to open a branch office here, at 32 Pine street. Mr. T. W. Parmele, who has long been identified with the gas and soft coal trade, is their agent. Most of the contracts for the Cumberland coals are made early in the season, the delivery to continue through the year. Those parties who intend making new contracts would do well to examine the George's Creek coal. Prices at New York on board, $7.25; at Baltimore $4.75 on board.

FOREIGN COALS.

Liverpool Hiver Cannel is in good demand, and a brisk trade is doing at our quotations.

GAS COALS.

There has been heavy sales made of late of American Despard, which is becoming very popular with our city gas companies. We have taken occasion several times to make favorable mention of this coal, and we are happy to hear that our "faith is well founded." There are also many contracts being made in Provincial gas coals.

FREIGHTS.

Freights are a little off this week, say five to ten cents. Vessels are in plentiful supply.

The following table exhibits the quantity of Coal passing over the following routes of transportation to tide-water, for the week ending November 13, 1869, compared with the same time last year:

COMPANIES.	1868. WEEK.	1868. TOTAL.	1869. WEEK.	1869. TOTAL.
Phila. & Reading R.R.	95,525	2,844,911	114,947	3,391,219
Schuylkill Canal	35,484	878,460	17,459	696,589
Lehigh Valley R. R.	54,710	2,115,291	54,929	1,878,435
Lehigh and Sus. R. R.	15,143	445,747	34,665	792,434
Lehigh Canal	38,507	903,211		584,030
Scranton North	15 050	544 569	16,491	372,802
" South	22,639	944 961	25,778	8 6,458
Penn. Coal Co., rail	13,762	813,556	9,635	832 8 5
" " canal	356	27,550	357	17,276
Del. and Hudson, rail			3,345	131,620
" " canal, north	46,116	1,456,505	51,490	1,057,277
" " south			5,175	107,813
Shamokin	11,057	442,676	16,140	403,346
Trevorton	1,385	28,758	1,740	30,353
Short Mountain	4,557	209,705	2,441	95,478
Lykens Valley Coal Co.	1,521	81,068	3,067	68,677
Huntingdon & Br'd Top	7,09	253,172	8,0 4	313,086
Wyoming South	7,195	306,1 4	11,324	2 9,402
" North	3,344	81,752	4,2 3	70,411
Williamstown, Col'y	6,174	165,816	6,841	181,953
Total	363,610	12,666,832	397,371	12,111,678
1869		12,111,678	363,601	
Decrease year		455,154	in 3,761 week	

Schuylkill Coal Trade.

Report of coal transported over the Schuylkill Canal for the week ending Thursday, November 11, 1869.

	Tons. Cwt.
From Port Carbon	12,423 15
" Pottsville	958 00
" Schuylkill Haven	13,213 10
" Port Clinton	864 00
Total for week	27,459 05
Previously this year	569,130 00
Total	586,589 05
To same time last year	828,460 02

Report of coal transported over the Philadelphia and Reading Railroad during the week ending Thursday, Nov. 11, 1869.

	Tons Cwt.
From St. Clair	58,125 03
" Port Carbon	9,421 10
" Pottsville	6,7.9 07
" Schuylkill Haven	36,551 11
" Auburn	4,129 13
" Port Clinton	16,231 06
" E. P. R. R.	64 02
" Harrisburg and Dauphin	14,762 15
Total paying freight	126,218 11
Coal for Company's use	3,686 19
Total for week	129,905 10
Previously this year	3,170,838 11
Total	3,300,744 01
To same time last year	3,297,604 13

Report of Coal Transported over Lehigh Valley Railroad

For the week ending November 13, 1869, and previously this season, compared with same time last year:

WHERE SHIPPED FROM.	WEEK. Tons. Cwt.	PREVI'S. Tons. Cwt.	TOTAL. Tons. Cwt.
Total Mahanoy	11,537 17	390,827 01	402 334 18
" Beaver Meadow	15.8 9 10	362,708 01	378,517 01
" Mauch Chunk	22 07	804 16	827 03
" Upper Lehigh		8,581 11	8,581 11
" Hazleton	16,154 11	708,27 19	724,431 10
" Wyoming	14.512 16	409,652 15	424,195 11
Total	58,036 11	1,880,851 03	1,938,887 14
To Lehigh & S. R. R., at P'n. Hav. for rail		4,562 07	4,562 07
Do. for canal		120,734 09	120,734 09
At Mauch Ch'k for canal		97,546 03	97,546 03
Total Anthracite	58,036 11	2,103,794 02	2,161,730 13
Bituminous Coal rec'd from Cata. R. R.			
N. C. R. R.			
E. P. R. R.	2,808 00	11,883 00	14,691 00
P. & N.Y. C. & R.R. Co			
Fall Creek			
Schroeder			
Towanda			
Total by rail and canal	60,844 11	2,115,577 02	2,176,421 13
Same time last year	72 391 13	2,392,3 2 15	2,462,017 08
Increase			
Decrease	11,547 02	276,785 13	286 595 15
Forwarded East from M'h Chunk by rail	54,523 08	1,823,475 16	1,878,405 04
Same time last year	54,740 05	2,060,550 12	2,115,290 17
Increase			
Decrease	185 03	237,074 16	236 895 13

RECAPITULATION.

Forwarded East from M'h Chunk by rail	54,929 08	1,823,475 16	1,878,405 04
Delivered at M'h Chunk	31 15	833 15	865 10
Delivered on line of road above Mauch Chunk	325 03	7,640 00	7,974 01
Delivered above M. Chunk for use of L. V. R.R.	1,000 10	40,127 13	41,128 30
To N. C. R. R., at Mount Carmel		2,516 09	2,516 09
Forwarded North from L. & B. Junction	1,655 11	2,164 19	3,820 10
To L. & S. R. R., at P'n Hav., for railroad		4,562 07	4,562 07
Do. for canal		120,734 09	120,734 09
Do. Packerton for rail	64 04	4,983 11	4,177 15
At M Chunk for canal		97,546 03	97,546 03
Total Anthracite	58,038 11	2,103,694 02	2,161,730 13
Bituminous Coal	2,802 00	11,883 00	14,691 00
Total all kinds	60,844 11	2,115,577 02	2,176,421 13

Lehigh and Susquehanna Railroad.

Report of Coal Shipped South for the week ending Nov. 13, 1869.

WHERE FROM	WEEK. Tons. Cwt.	TOTAL. Tons. Cwt.
Total Manch Chunk Region	14,453 06	190,935 03
" Hazleton "	31 16	119,684 03
" Upper Lehigh "		77,193 12
" Wyoming "	20,179 13	700,296 14
Grand Total	34,664 15	1,088,109 12
Corresponding week last year	33,976 02	886,754 00
Increase	688 03	201,355 12
Decrease		
Forwarded South from Mauch Chunk	33,631 09	730,390 15
Delivered on line of Lehigh & Susq'na R. R., above Mauch Chunk	819 08	30,208 18
Delivered to Lackawanna & Bloom. R. R., at Plymouth Bridge	213 18	17,683 03
Delivered to Lehigh Valley R. R. Co., at Sugar Notch		5,151 03
Delivered at Coal Port, for shipment by Canal		295,675 09
Total	34,664 15	1,088,109 12

Prices of Coal by the Cargo,

[CORRECTED WEEKLY.]

	AT NEW YORK, Nov. 19.		AT PHILADELPHIA, Nov. 17.	
SCHUYLKILL.	R. A.	W. A.	R. A.	W. A.
Lump	$— —	$7 00	— —	6 00 to — —
Steamer	— —	7 00	— —	6 00 to — —
Broken	— —	7 75	— —	6 50 to — —
Egg	— —	8 5	— —	7 00 to 7 50
Stove	8 50	9 00	— —	7 00 to 7 50
Chestnut	— —	7 00	— —	6 50
Pea	— —	— —	— —	— —
LEHIGH.				
Lump	— —	8 50	— —	— —
Steamer	— —	8 50	— —	— —
Broken	— —	8 00	— —	— —
Egg	— —	8 00	— —	— —
Stove	— —	8 50	— —	— —
Chestnut	— —	7 00	— —	— —
Pea	— —	— —	— —	— —
SPECIAL COALS.				
Diamond Vein	R. A.	9 50	— —	— —
New England	"	— —	— —	— —
Locust Dale	W. A.	9 00	— —	— —
Honey Brook, Le'h	W. A.	8 00 to 8 50	— —	— —
Spring Mount	" "	8 00 to 8 50	— —	— —
Sugar Creek	" "	8 00 to 8 50	— —	— —
Sugar Loaf	" "	8 00 to 8 50	— —	— —
Fulton	" "	8 00 to 8 50	— —	— —
Stout	" "	8 00 to 8 50	— —	— —
Old Comp'y's	" "	8 00 to 8 50	— —	— —
Cross Creek	" "	8 00 to 8 50	— —	— —
Chauncey	" "	— —	— —	7 00 to 7 50
Girardville	" "	— —	— —	7 00 to 7 50
McMichael	" "	— —	— —	— — to 8 00
Duncan	" "	— —	— —	— —
Shamokin	" "	7 50	7 50	— —
Lykens Valley	" "	— —	8 00	— —
Broad Top	" "	— —	5 25	— —
Hill & Harris	" "	— —	7 25	— —
Henry Clay	" "	— —	7 50	— —
Powelton	" R. A.	— —	7 50	— —
Burnside	" "	— —	— —	8 00

BITUMINOUS COALS.

Kittaning Coal Co.'s Phœnix Vein, f.o.b. at Phila.	$5 25
" Lemon "	6 00
Cumberland C. & I. Co.'s on board	N. Y. — 7 25
Central C. & M. Co.'s "	" 7 52
Consolidated Coal Co.'s "	" 7 25

[*Dealers in these coals may be found in our advertising columns.]

Company Coals.

	L.	Str.	Gra.	Eg.	Sto.	Cst.
Scranton at E. Port	6 50	6 50	6 75	7 25	8 50	6 50
Pittston at Newb'g	6 40	6 40	7 00	7 50	8 25	6 50
Lackawana at Rond't.	6 50	6 75	7 00	7 75	8 25	6 75
Wilk'b're at Hoboken.	6 50	6 50	7 00	7 25	8 00	6 50

For freights to different points, see "Freights."

Prices for Coal at Mauch Chunk.

	F.L.	Bro.	Gra.	Eg.	Sto.	Cst.
Lehigh	$4 25	$4 75	$4 75	$4 75	$5 00	$4 25
Wilkesbarre	4 25	4 75	4 75	4 75	5 00	4 25

For freight to Elizabethport and to New York see "Freights."

Prices of Foreign Coals.

November, 1-69.
Duty $1.25 per ton.
Corrected weekly by PARMELE BROS., No 32 Pine street, New York.

Liverpool Gas Caking	$ 9 50@— —
" " Cannel	14 00@— —
" House "	17 50@18 00
" " Orrel	16 00@18 00
Per ton 2,240 lbs., ex-ship.	
PRICES FROM YARD.	
Liverpool House Orrel, screened	$16 00@18 00
" " Cannel, "	18 00@19 00
Per ton 2,000 lbs., delivered.	

Prices of Gas Coals.

November, 1869.

PROVINCIAL.

Duty, $1 25.	Coarse. Gold.	Slack. Gold.
Block House	$1 75 @— 75	
Gowrie	1 75 @— 75	
Lingan	1 75 @— 75	
Sydney	2 13¾@— 71½	
Pictou	2 13¾@1 12½	
Little Glace Bay	1 50 @1 10	
Caledonia	1 50 @— 75	

AMERICAN.

	Coarse. Currency.	Slack. Currency.
Westmoreland Co.	— — @— —	
Despard Coal Co.	$8 50 @8 00	
Penn.	— — @— —	
Newburg Orrel Gas	— — @— —	
West Fairmount Gas Coal	— — @8 00	

AT PHILADELPHIA.

Powelton	$7 00

Prices at Baltimore—NOV. 1869.

Wholesale Prices to Trade.

Wilkesbarre, by cargo or car load	$7 50@8 00
Pittston and Plymouth	7 25@8 75
Shamokin Red or White Ash	6 50@7 00
Lykens Valley Red Ash	7 40@7 80
Trevorton, Red Ash	— —@— —
By retail, per ton of 2240 lbs. delivered	9 00@9 75
Georges Creek & Cumberland f. o. b. at Locust Point for shipping	4 85@5 00
West Fairmount Gas f. o. b.	— —@6 50

Prices at Georget'n, D.C., & Alexandria, Va.

November, 1869.

George's Creek and Cumberland f. o. b. for shipping..$4 75

Prices at Havre de Grace, Md.

November, 1869.

Wilkesbarre and other White Ash for cargoes	$— —@7 25
Lykens Valley	— —@7 50
Shamokin Red or White Ash	— —@7 25
Trevorton and Zebra Valley	— —@7 00

Rates of Transportation to Tide Water.

BY RAILROAD.

TO PORT RICHMOND, PHILADELPHIA.

Philadelphia and Reading Railroad, from Schuylkill Haven	$2 50
From Port Carbon, 8 cents per ton more.	

TO ELIZABETHPORT.

L. V. Railroad from Mauch Chunk to Easton	$1 15
C. R. R., N. J., Easton to Elizabethport	1 70
Shipping expenses at Elizabethport	25
Total	$3 10

TO PORT JOHNSON.

L. V. R. R.	$1 15
C. R. R., of N. J.	1 80
Shipping expenses	25
Total	$3 20

TO HOBOKEN.

L. V. R. R.	$1 15
Morris & Essex R. R.	1 80
Shipping expenses	25
Total	$3 20

TO SOUTH AMBOY.

L. V. R. R.	$1 15
R. & D. R. R.	1 10
Cam. & Am. R. R.	50
Shipping Expenses	25
Total	$3 00

BY CANAL.

Via Schuylkill Canal.

TO PHILADELPHIA.

From Schuylkill Haven	$1 70
" Port Carbon	1 70
" Port Clinton	1 70

TO NEW YORK.

From Schuylkill Haven	$2 20

Via Lehigh Canal.

TO PHILADELPHIA.

Lehigh Canal	$1
Freight and wharfage	1 1
Total	$2 29

TO NEW YORK.

Lehigh Canal	$ 71
Morris "	86
Freight	1 70
Towing	10
Total	$3 36

TO JERSEY CITY.

Lehigh Canal	$ 71
Morris "	95
Freight	1 60
	3 25
For re-shipment	30
Total	$3 56

Via Delaware and Raritan Canal.

TO NEW YORK.

Lehigh Canal	$ 71
Delaware Division Canal	43
Delaware and Raritan Canal	57
Freight	1 45
Towage	10
Total	$3 36

TO NEW BRUNSWICK.

Lehigh Canal	$ 71
Delaware Division Canal	43
Delaware and Raritan Canal	57
Freight	1 20
Total	$2 91

For Re-shipment—30 extra for shipping, and 10 cents. drawback.

Freights.—NOVEMBER, 1869.

TO EASTERN PORTS.	From Philadel'a.	From E. Port and Port Johnson.	From Newburg.	From Rondout.
Stamford	$1 00	$1 15	$1 30	$1 25
Norwalk	2 00	1 15	1 30	1 25
Bridgeport	2 00	1 15	1 30	1 25
New Haven	2 00	1 15	1 25	1 25
Hartford	2 75	1 75	— —	1 90
New London	2 00	1 40	1 60	1 65
Norwich	2 00	1 40	1 65	1 60
Mystic	2 00	— —	1 45	— —
Stonington	2 00	1 50	1 60	1 60
Sag Harbor	2 00	1 25	1 45	— —
Bristol	2 00	1 40	1 55	1 55
Newport	2 00	1 40	1 55	1 45
Fall River	2 00	1 45	1 55	1 50
Providence	2 00	1 40	1 60	1 60
Dighton	— —	— —	1 30	— —
Warren	— —	— —	1 60	— —
Pawtucket	2 00	— —	1 75	1 65
New Bedford	2 00	1 50	— —	1 75
East Cambridge	2 00	— —	1 85	2 10
Salem	2 50	2 00	2 20	2 10
Newburyport	2 50	2 00	1 85	2 20
Portsmouth	2 50	2 00	2 10	2 10
Rockport	— —	— —	1 90	— —
Saco	2 75	2 00	— —	2 00
Portland	2 50	2 00	2 20	— —
Bangor	2 50	— —	1 75	1 80
Bath	2 50	2 00	2 00	2 00
Middletown	1 50	— —	— —	— —
Amesbury	2 50	— —	— —	— —
Boston	2 50	2 00	2 25	2 25
Cambridgeport	2 50	— —	1 85	2 05
Taunton	2 50	2 00	1 85	— —
Derby	2 00	1 25	1 90	— —
New York	1 55	80	85	85
Hackensack	1 75	— —	— —	— —
Jersey City	1 65	80	85	85
TO RIVER PORTS.				
Troy	1 75	1 25	60	65
Albany	1 75	1 24	55	50
Coeyman's	1 60	— —	55	50
Stuyvesant	1 50	— —	50	45
Cocksackie	60	— —	45	45
Hudson	— —	50	40	50
Catskill	— —	— —	40	35
Poughkeepsie	1 60	75	30	25
Fishkill	1 60	— —	20	30
Cold Spring	1 60	70	30	50
Haverstraw	— —	50	45	55
Nyack	1 60	50	55	40
Sing Sing	1 60	— —	60	50
Yonkers	— —	40	60	55
New York	1 55	80	70	— —
Saugerties	1 55	— —	35	30
Rhinebeck	1 60	— —	30	35
Rondout	1 60	60	30	25
Tarrytown	1 60	80	60	— —
West Point	1 60	75	30	50
Cold Spring				21 "
Newburgh				22 "
Poughkeepsie				22 "
Rondout				23 "

Boats of 100 Tons	Per Boat
To Manhattanville, and Return	$12 0
Spuyten Duvvil, "	14 00
Yonkers, "	15 00
Sing Sing, "	25 00
Peekskill, "	25 00

Foreign and Provincial Freights.

September, 1869.

Foreign.	
Newcastle and Ports on Tyne	£15@£17 keel
Liverpool	15s. —. do
TO NEW YORK.	
Provincial.	
Sidney	$3 25
Lingan	3 25
Cow Bay	3 25
Port Caledonia	3 25
Little Glace Bay	3 25
TO BOSTON.	
Sydney	$2 75
Lingan	3 75
Cow Bay	3 25
Port Caledonia	3 00
Little Glace Bay	2 25

Towing Rates.

TO EASTERN PORTS.

	Per Ton.
To New Haven	$ 40
Bridgeport	40
Southport	40
Westport	40
Norwalk	40
Stamford	40
	Per Boat.
Greenwich	$70 00
Port Chester	80 00
Mamaroneck	70 00
Glen Cove	55 00
New Rochelle	55 00
East Chester	60 00
West Chester	30 00
White Stone	30 00
College Point	25 00
West Farms	25 00
Flushing	30 00
Harlem and Mott Haven	20 00
Port Morris	20 00
Ninety-first street and Astoria	16 00

Boats beyond Port Chester, with less than 200 tons, $20 per Boat.

TO RIVER PORTS.

Boats of 150—250 Tons.	Per Ton.
To Manhattanville	9 cents.
Spuyten Duyvil	9 "
Yonkers	10 "
Hastings	12 "
Piermont	15 "
Dobbs' Ferry	15 "
Nyack	16 "
Tarrytown	17 "
Sing Sing	18 "
Croton Landing	19 "
Haverstraw	20 "
Verplanck's	20 "
Peekskill	20 "
West Point	21 "

METALS.

IRON.—Duty: Bars, 1 to 1½ cents ₱ lb; Railroad, 70 cents ₱ 100 lbs.; Boiler and Plate, 1½ cents ₱ lb; Sheet, Band, Hoop, and Scroll, 1¼ to 1¾ cents ₱ lb; Pig, 9 ₱ ton; Polished Sheet, 3 cents ₱ lb.

Pig, Scotch No. 1, ₱ ton	35 50@38 00
Pig, American, No. 1	40 00@41 00
Pig, American, No. 2	37 —@38 —
Pig, American, Forge	36 —@— —
Bar, Refined, English and American	85 —@— —
Bar, Swedes, assorted sizes (gold)	82 50@85 00
	Store Prices.
Bar, Swedes, ord'y sizes, less 5 ₱ ct	—@141 —
Bar, Refined " "	95 —@100 —
Bar, Common " "	87 50@ 90 —
Scroll	120 —@130 —
Ovals and half-round	120 —@145 —
Band	120 —@— —
Horse Shoe	120 —@— —
Rods, ⅜ to 5-16 inch	100 —@105 —
Hoop	125 —@130 —
Nail rod, less 5 ₱ ct	— 8½@— 9½
Sheet, Russia, as to Nos. (gold)	— 10½@— 11½
Sheet, Single, D. and T. Common	— 5¼@— 7
Sheet, Galvanized	List 15@25 ₱ cent. discount.
Rails, English (gold), ₱ ton	57 00 @— —
Rails, American, at Works in Pa	— — @57 00

STEEL.—Duty: Bars and ingots, valued at 7 cents ₱ lb or under, 2½ cents: over 7 cents and not above 11, 3 cents ₱ lb; over 11 cents, 2½ cents ₱ lb, and 10 ₱ cent ad val. (Store prices.)

English Cast (2d and 1st quality) ₱ lb	— 18 @— 22
English Spring (2d and 1st quality)	— 9 @— 11½
English Blister (2d and 1st quality)	— 11½@— 13
English Machinery	— 12½@— 15
English German (2d and 1st quality)	— 14 @— 16
American Blister "Black Diamond"	— 10½@— 16
American, Cast, Tool do.	— 19 @— —
American, Spring, do.	— 10 @— 13
American Machinery, do.	— — @— 13
American German, do.	— 10 @— 13

COPPER.—Duty: Pig, Bar, and Ingot, 5; old Copper cents ₱ lb; Manufactured, 45 per cent. ad val.

	All Cash.
Copper, New Sheathing, ₱ lb	— @— 32
Copper Bolts	— @— 33
Copper Braziers, 16oz. and over	33 @— 35
Copper Nails	38 @— 40
Copper, Old Sheathing, &c., clean	20 @— 21
Copper, Chili Pig	— @— —
Copper, American Ingot	22 @— 22½
Yellow Metal, New Sheating	— @— 27
Yellow Metal Bolts	— @— 27
Yellow Metal Nails	— @— 27

LEAD.—Duty: Pig, $2 ₱ 100 lbs.; old Lead, 1½ cents ₱ lb; Pipe and Sheet, 2½ cents ₱ lb.

Galena, ₱ 100 lbs	$— — @— —
Spanish (gold)	6 35 @6 50
German, do.	6 35 @6 55
English, do.	6 25 @6 87½
Bar (net)	8 50 @— —
Pipe and Sheet (net)	8 50 @— —

TIN.—Duty: Pig, Bars, and Blocks, 15 ₱ cent. ad val.; Plate and Sheets and Terne Plates, 25 ₱ cent. ad val.

	Gold ₱ lb.
Banca	37 @37½
Straits	33½@33¾
English	32 @32½

PLATES.

	Fair to Good Brands. Gold.	Currency.
I. C. Charcoal, ₱ box	$8 12½@8 37½	$11 00 @11 50
I. C. Coke	6 75 @7 37½	9 00 @10 25
Coke Terne	— — @6 00	— — @ 8 50
Charcoal Terne	7 75 @8 25	10 10 @11 25

SPELTER.—Duty: In Pigs, Bars, and Plates, $1 50 ₱ 100 lb.

	Gold.
Plates, Foreign ₱ 100 lbs.	$6 12½@6 25
Plates, Domestic ₱ lb.	9 @— 12

REMARKS.

IRON.—There is no improvement in the demand for Scotch Pig, but there is a better feeling prevalent, and prices are a shade firmer. We quote $35.50 @ $38 for all brands. The sales are 250 tons Eglinton at $35, and 150 do. Glengarnock, $36.50 @ $37. The market for American remains quiet, no transaction of importance having transpired since our last. Prices remain steady at our quotations. Wrought Scrap is in moderate request, and we notice sales of 100 tons from yard at $49. There is a little more inquiry for new Rails, and sales have been made of 1,500 tons 50-lb. English and 900 do. old, part to arrive, on private terms.

COPPER.—New Sheathing is steady at 32 cents and Yellow Metal 27 cents, cash. Ingot moves slowly, but prices are unchanged, the market, if anything, having rather more tone than before; sales have been made of 160,000 lb. Lake Superior at 22½ @ 22¾ cents, closing at the latter price, and 50,000 lb. Baltimore, 22, cash.

TIN.—Pig is only in small trade demand at previous prices—say 33½ cents for Straits, and 33¾ gold, for English; five tons Banca sold at a private price. Plates are excessively dull, and we have to notice the sale of 500 bxs. I. C. Coke on terms not yet made public.

SALTPETRE.—Crude is quiet; 300 @ 400 bags sold in Boston at 11½ cents currency.

LEAD.—The market for Pig remains very quiet, and we have only to notice the sale of sixty tons Spanish at $6.25, gold.

SPELTER—Remains dull, and we have only to notice the sale of 20 tons Silesian at $6.18¾, gold.

ZINC.—American, dry, 8c.; French, dry, 11¾c.; French, metallic, 12c.

MANGANESE—5c. per lb.

Mining Stocks.

NEW YORK, Nov. 19, 1869.

Mining stocks are a shade lower. Among the transactions at the Board to-day we notice 500 Grass Valley at $20, and 500 Smith and Parmelee at $1.70. Hilton Copper is now quoted at $2, Quincy $20@$26, Mendota $5 asked, and Minnesota $1 offered.

In Petroleum stocks we notice 5,000 United Petroleum Farms at $21, and 100 Home at $8.50. Prices continue firm, and in some instances they have slightly advanced. The following are the latest quotations:

	Bid.	Asked.
Bennehoff	30	35
Clinton Oil	—	—
Brevoort	1 60	1 90
Buchanan Farm	35	40
Home Petroleum	8 45	8 90
Central	70	79
New York and Alleghany	1 10	—
National	1 00	—
United States	75	1 00
Northern Light	—	1 00
United Petroleum Farms	20	21
Rynd Farm	30	35
Pithole Creek	1 75	2 00
Bergen Coal and Oil	25	50
Second National	50	75
Rathbone Oil	20	—
Union	15 50	—

San Francisco Stock Market.

SAN FRANCISCO, November 17, 1869.

	1st Board.	2d Board.
Savage	61¾	63
Crown Point	15¾	—
Yellow Jacket	51	52½
Kentucky	—	1 72½
Chollar Potosi	22½	23
Gould & Curry	79	80
Ophir	14½	14½
Alpha	18½	20
Belcher	15¾	15¾
Imperial	—	48
Hale & Norcross	1 89	1 90

London Weekly Metal Report.

LONDON, E. C., October 29, 1869.

The Metal Market has been very dull, but prices show but little change :

IRON.—Welsh bars are firm, £6 10s. being realized ; rails fully maintained. In Staffordshire, the makers of marked iron have issued notices that they will only accept orders subject to any alteration of price which may occur. Scotch pig iron is firm at 53s. 4d. cash.

COPPER.—The market for Chili bars is dearer, owing to charters for the first fourteen days of September being 250 tons. £67 10s. and £67 15s. has been paid cash, and £68 10s. three months. English copper is unchanged, and India sheets £77. Tough, £72 to £73. Burra and Wallaroo hold for £74 ; buyers offer £74.

TIN.—The market is firm. Straits, £125 ; Banca held for £127. In Holland, Banca is quoted 73fl. English tin firm at full quotations.

TIN-PLATES.—No important improvement to report.

SPELTER.—Market very quiet and irregular. Silesian, good merchantable brands, £19 10s.; £19 15s. paid for exports ; V. and S., £19 ; German and Belgian, £19 2s. 6d. to £19 5s.

LEAD.—Firm L., and B., £19 5s.; good English, £19 ; soft silver, £18 7s. 6d.

VON DADELSZEN & NORTH.

A National School of Mines.

WE find in the New York *Shipping and Commercial List*, the following sensible article in relation to our mineral wealth and the imperative necessity of the early establishment of a National School of Mines. It is gratifying to see business people giving attention to this subject : "Despite the exhaustion of placer mining on the Pacific coast, it is estimated that between three and four hundred millions of dollars' worth of gold and silver have been extracted from the mountains and valleys of California, Nevada, Idaho, Montana, Colorado, etc., since 1860, and added to the world's available supply of precious metals—an amount which has served to meet our foreign trade balances, and leave us, probably, about as strong in specie at present as we were before the rebellion. But for precious metals thus brought to light, we should have been compelled to sell Europe far more of our Government bonds, and sold them cheaper, and our debt would not only have been larger, but more of it would have been held abroad than now. Our mineral fields are very extensive, and there is no doubt that the bullion product, now variously estimated at from fifty to seventy-five millions of dollars per annum, could be doubled, if not trebled, if a higher style of scientific knowledge and skill were made available, in working the mines, and treating the ores which they yield. We have, in different parts of the country, a few scientific men who have been thoroughly trained in the schools of Europe, but they are so few that their influence is hardly felt in the great department of industry with which their profession connects them. We need a vastly larger number of such men, and we ought to have a school at home, in which they can be trained as thoroughly as they can be anywhere abroad. We do not see why such a school would not be as useful to the country as the Military or Naval Academy. It is scarcely possible to estimate the amount of capital which has been wasted during the last dozen or fifteen years, for the want of a more adequate scientific knowledge of this whole subject. Had there been, anywhere in the land, the thorough scientific knowledge required in order to ascertain the resources of a mine, or the proper method of development when ascertained, untold millions of dollars might have been saved to the American people. It would, of course, be idle to suggest that all waste would have been prevented, by any amount of scientific mining, however exact. At the same time, in proportion as that subject is reduced to exact laws, and made capable of being judged of by those who connect their capital with it, will such waste disappear. We are now dependent almost entirely upon foreigners, not only for the skilled labor which we employ in mining, but also for the scientific methods by which the presence of valuable ore is to be determined, and its value ascertained ; and yet we are the leading mineral producing nation of the world. Our mineral lands are not the exclusive property of the Government, as in most other countries, but they are open to the purchase of the whole people. Their extent and value, too, are among the unsolved problems. Besides the States and Territories in which rich minerals are known to abound, we have other lands of unknown extent, which are supposed to abound in mines, yet awaiting the decision of scientific exploration. Until they shall be subjected to such exploration, their value can never be known, and it is altogether probable that they will periodically give rise, in the future—as the older sections have in the past—to feverish excitements and unhealthy speculations, so long as they belong to the realms of imagination. A country, situated as ours is, certainly needs scientific knowledge, and that of the most exact kind, in relation to this whole subject, and we do not see how it is ever to be adequately supplied, save by the establishment by Government of a great school that shall be specially devoted to furnishing it, and preparing young men to apply it. Indeed, it is not probable that a single school would be anything near adequate to the purpose ; but it would prove to be a decisive experiment, and once in operation, its advantages would be too clear ever to be called in question."

Oscillation of Railway Trains.

SIR CHARLES FOX states his opinion that the oscillation of railway trains, more especially at high velocities, producing what is ordinarily called "guage concussion," is caused in a very great measure by the use of wheels the tires of which are portions of cones instead of cylinders. It is well known to engineers that the tires of railway wheels are generally coned to an intonation of one in twenty. It is considered that these were first introduced by GEORGE STEPHENSON, in the expectation of facilitating the passage of vehicles round curves by their adapting themselves, through their various diameters, to the different lengths of the two rails on which they were running. This, however, is not the case in practice. No advantage is found to arise in the use of conical wheels in passing round curves, and as much evil results therefrom on straight lines, Sir CHARLES has constructed upward of 250 miles of railway abroad, in the rolling stock of which he has departed from the usual form of wheel, and has used only cylindrical ones, and he has been gratified with the satisfactory reports of the steadiness of trains supplied with them.

Cause of Nitro-Glycerine Explosions.

MUCH of the mystery that has surrounded the cause of many of the nitro-glycerine explosions is now explained by the recent observation of M. JOUGLET, who positively asserts that this compound, however carefully and well prepared, *is subject to spontaneous alteration, whereby it becomes acid and disengages gas.* This is doubtless the true clue to the fearful explosions so frequently and unaccountably accompanying the storage and transportation of this material, and it at once suggests the true preventive of their recurrence. It should only be made on the spot when wanted, and in such quantities as its immediate use demands. Legislation is necessary in this country towards this end, as it has already been in England and some countries of continental Europe.

Engineering and Mining Journal in Missouri.

From the Missouri Washington County Journal, Nov. 11.

THE ENGINEERING AND MINING JOURNAL is undoubtedly one of the most ably conducted publications of the country. Its extended reviews of the mining interests of the United States—embracing accurate reports of all the more important developments made in Missouri—recommends it more especially to our readers. Single numbers of this paper might be taken from each year's file, which would well pay the subscriber for the outlay of one year's subscription price.

A Remarkable Railroad.

THE most remarkable railroad in Germany and Europe is the new Black Forest Road, which will be completed within four years. Between Hornberg and St. George, situated 2,870 feet above the level of the sea, and but four miles distant from Hornberg, the railroad ascends nearly 2,000 feet, and passes through 27,000 feet of tunnels. Eleven thousand feet of the latter have been completed during the last two years. The truly cyclopean work on the road is progressing rapidly, and attracting thousands of visitors, who flock there from all parts of Southern Germany and Switzerland.

Sutro Tunnel.

ACCORDING to last advices from Virginia City, the Sutro Tunnel was in eighty-eight feet—that is, the "leader," which is being driven in advance of the main work. The ground is still a mixture of clay and boulders. A car track is being laid down.

MINING COMPANIES AND STOCK QUOTATIONS.

GOLD AND SILVER COMPANIES.	SITUATION OF MINE.	SECRETARY AND PLACE OF BUSINESS.	CAPITAL.	PAR VALUE.	OFF'R'D.	ASKED.
Alameda Silver		A. Queran, 108 Wall st.	$2,000,000	$10 00		
Ada Elmore	South Boise, Idaho					
American Flag	Nevada District, Col.	P. P. Fullerton, 71 B'way	600,000	10 00		
Atlantic and Pacific	Humboldt Co., Nevada.					
Bates and Baxter	Colorado			50 00		
Benton	Colorado	W. F. Drake, 15 Broad	500,000	5 00	5	
Briggs	Colorado	J. P. Davies, 19 Cliff	1,000,000	100 00		
Black Hawk	Colorado	C.T.Whittington, 48 Broad	2,500,000	100 00	29	
Bobtail	Colorado	J. Stanton, Jr., 25 Nassau	1,000,000			
Bullion Consolid'ed Gold	Colorado					
Burroughs Gold	Colorado					
Church Union Gold	California					
Consolidated Gregory	Colorado				1 15	1 35
Combination Silver	Nevada			100 00	1 50	
Columbia Silver	Austin, Nevada	J. M. Brown, 155 B'way	5,000,000			
Commercial Silver		J. E. Smith, 26 Pine	3,000,000			
Corydon	Gilpin Co., Colorado	J. Samuels, 40 B'way	500,000			
Downieville	Colorado		2,500,000	25 00		
Eagle Gold	Gold Dirt Dist., Col.	J. P. Davies, 19 Cliff	300,000	1 00		
Empire Gold and Silver	BodieBluff,MonoCo.Cal	H. K. Gates, 70 B'way	1,000,000			
Edgehill		A. Fullerton, 71 B'way	10,000,000			
Esperanza Silver		Ezra Clark, Jr., 13 William	400,000			
Fisk Gold		H. Johnson. 135 Fulton	500,000			
Forest Queen		E. B. Beet, 62 B'way	1,000,000			
Golconda Gold	Sherbrooke, C. E.	H. Adams, 71 Broadway	2,000,000			
Gregory	Colorado		1,250,000			
Gunnell Gold	Colorado	J. H. Rolston, 80 B'way	1,000,000	50 00		39
Gunnell Central	Colorado	C. B. Bostwick, 16 B'way	3,000,000	10 00		
Gold Rock		R. M. Lockwood, 93 Wall	400,000			
Grass Valley					19	20
International Silver		J. W. Brazier, 26 Pine	600,000			
Hope Gold	Colorado		5,000,000			
Holman			2,000,000	25 00		
Kipp & Buell	Colorado		300,000			
Knickerbocker Gold		J. H. Rolston, 80 B'way	200,000	100 00		
La Crosse Gold	Nevada Dist., Col.	P. P. Fullerton, 71 B'way	1,000,000			
Lander Hill T. & S.	Nevada	M.L.Catherwood,74 B'way	1,000,000			
Lewis Gold	Georgia		1,000,000			
Liberty Gold						
Manhattan Silver	Nevada	M. L. Ogden	400,000			
Maraposa common	California	Jas. H. Ferdon, 34 Wall	12,000,000		8	8½
Mariposa preferred	California	do. do.			15½	16
Montana Gold		G. De Cordova	400,000		3	
Montana M. L. & M. Co.	Montana	A. M. Hoyt, 22 William	250,000			
Montrose	Clear Creek Co., Cal.	W. W. Perkins, 71 B'way	1,000,000			
New York Silver	Nevada	Thos. Sproull, 78 B'way	1,500,000			
New York and Austin	Nevada	E. R. Siccomb, 70 Wall	500,000			
New York and Owyhee	Owyhee Co., Idaho		1,000,000			
New York and Eldorado		G. H. Munroe, 10 Wall	2,000,000			
N. Y. & Montana M. & D.	Montana	F. A. Chapman, 20 Nassau	1,250,000			
N. Y. & Silver Peach	Nevada	R. C. Root, 74 B'way	2,000,000			
N. Y. & Utah P. & M.		W. H. Mailler, 108 Wall				
Ophir Gold	Comstock Lode, Nev.	L. C. Warner, 70 B'way	625,000			
Owyhee Gold		W. H. Smith. 43 Ex. Place	1,700,000			20 00
Pahranagat Central	Nevada	J. E. Smith, 25 Pine	6,000,000			
Quartz Hill Gold		F. Bernard	2,500,000		1 25	1 35
Reese River Consol'd	Nevada	W. B. Ogden	6,000,000			
Rocky Mountain	Colorado	S. M. Pond, 70 B'way	500,000	10 00		
Rollins Gold		Thos. Bond, 132 B'way	600,000			
Sensenderfer	Colorado	H. A. Shewill, 19 Broad	1,000,000			
Silver Bend		F. W. Macy, 20 Nassau	1,500,000			
Silver Mt. Silver		H. A. Moen, 71 B'way	1,000,000			
Silver Peak & R. M.	Nevada	W. B. Ogden, 52 Wall	5,000,000			
Smith & Parmelee	Colorado	W. H. Hollister, 6 Broad	2,500,000	20 00	1 65	1 75
Social & Steptoe Con.		T. H. O'Connor, 24 Nassau	450,000			
Standard Gold		C. B. Bostwick, 169 B'way	500,000			
Symonds Forks					40	60
Twin River Silver	Nevada	J. F. R. Hadden, 20 Nassau	800,000	100 00		
Texas Gold	Colorado		500,000	10 00		
Union Gold	Colorado	F. A. Potts, 110 B'way	1,200,000			
Wash. Mill & Silver	Nevada	W. W. Perkins, 71 B'way	300,000			
Wauba Yuma	Arizona	J. W. Silsby, 36 Pine	6,000,000			

COAL AND IRON COMPANIES.	SITUATION OF MINE.	SECRETARY AND PLACE OF BUSINESS.	CAPITAL.	PAR VALUE.	OFF'R'D.	ASKED
American Coal Co		M. A. Myers, 119 B'way	$1,500,000	$25 00		
Ashburton Coal Co		J. T. Rollins, 41 Pine	2,500,000			
Block House Coal		D. B. Keeler, Jr., 43 Pine	1,000,000			
Brewster Iron		H. Robison, 165 B'way	150,000			
Broad Top Coal & Iron Co	Pennsylvania	B. Love	2,000,000			
Cameron Coal Co		J. A. Simpson, 40 B'way	2,500,000			
Carbon Hill Coal Co		J. Silsby, 36 Pine	1,000,000			
Central Coal		F. P. White, 111 B'way	2,000,000	100 00		
Clifton Iron Co		P. H. Riordan, 34 Pine	1,250,000			
Columbia Iron		E. D. Webb, 77 Cedar	1,000,000			
Consolidation Coal	Maryland	J. S. Mackie, 71 B'way	5,000,000			
Crawford Coal		E. Clapp, Prest, 137 B'way	1,000,000			
Cumberland C. & I. Co		E. Kisean, 90 B'way	5,000,000		26⅜	28¾
Derby Coal Co		W. S. Davison, 11 Broad				
Dover Coal and Iron Co		L. Chase, 88 Wall				
Del. & Hudson Canal Co			10,000,000	100 00		
Ebervale Coal		G.L Stout, Treas.,111 Br'y	500,000			
Fall River Bituminous		D. T. Blauvelt, 43 Pine	1,000,000			
Farrar Coal		C. H. Jones, 43 Pine	250,000			
Fisher Iron Co		M. Ellis, 19 William	100,000			
Hamp're & Balt. Coal		S. M. Pond, 70 B'way	500,000			
Iron Cliffs Co		C. J. Canda, 52 Wall	1,000,000			
Jackson Iron		G. P. Loyd, 119 B'way	360,000			
Kemble Coal & I. Co		R. A. Wight, 26 Ex. Place	300,000			
Keokuk Coal		J. F. Franklin, 112 B'way	100,000			
Lackawanna I. & C	Pennsylvania	E. C. Lynde, 52 Wall	1,200,000			
Lewis Run C. & I. Co		C. A. Sanborn, 80 B'way	750,000			
Lykens Val. Coal Co		F. A. Platt, 13 William	800,000			
McKean Co. Bit. Coal Co.		J. H. Rolston, 80 B'way	1,500,000			
Lehigh & Susquehanna						
Mahanoy			400,000	100 00		
McNeal C. & I. Co		C. C. Godwin, 71 B'way	500,000			
Mount Riga Iron		G. M. Newton, 42 Cedar	300,000			
New Boston Coal		C. H. Ogden, 55 B'way	2,000,000			
N. Y. Con. C. & I. Co		A. T. Levine, 16 Wall				
N. Y. & Lehigh Coal		T. Simpson, 111 B'way	150,000			
Pacific Coal Co		G. Wrighton, 34 Wall				
Peekskill Iron Co		W. Murdock, 7 Nassau				
Pennsylvania Coal Co		C. H. Mead, 111 B'way	3,200,000	50 00		
Richmond Iron Co		C. H. Smith, 165 B'way	1,000,000			
Scotia Coal Co		I. N. Soper, 42 B'way	2,500,000			
Spring Mt. Coal		C. Runyon, 111 B'way	1,250,000			
Springfield & D'p Run C.		E. D. Webb, 77 Cedar	600,000			
Stout Coal Co		G. S. Comstock, 111 B'way	500,000			
Susquehanna & Wyoming		E. Potter, 40 B'way	1,000,000			
Tannerdale Coal		I. T. Ludlaw, 71 B'way	250,000			
Wash. Mutual Coal		M. C. Baker, 117 B'way	420,000			
West Point Iron Co		R. C. Brock, 110 B'way	500,000			
Wilkesbarre C. & I. Co		W. H. Tillinghast, 80 Br'y	3,400,000			
Wyoming Val. Coal Co		E. Potter, 40 B'way	1,000,000			

COPPER AND LEAD COMPANIES.	SITUATION OF MINE.	SECRETARY AND PLACE OF BUSINESS.	CAPITAL.	PAR VALUE.	OFF'R'D.	ASKED.
Anita Copper	California	J. A. Ferguson, 8 Wall				
Corinth Copper	Corinth, Vermont	S. H. Howard, 191 B'way	$500,000	25 00		
Davidson Copper					3	
Eagle Harbor Copper	Michigan	W. H. Smith, 43 Ex. Place	500,000	25 00		
Evergreen Bluff Copoer	Michigan	F. W. Caper, 44 Ex. Place	500,000	25 00		
Globe Copper		R. K. Rickard, 19 Nassau	200,000			
Grand Portage Copper Co		A. S. Kellogg, 22 Pine	500,000			
Guymard Lead		Samuel Vernor, 38 Pine				
Hilton Copper		W. H. Smith, 43 Ex. Place	500,000			2 00
Hope Copper		J. W. Davis, 19 Nassau	500,000			
Hudson River Copper	New York	T. Clarkson, 22 William	1,500,000			
Indiana Copper Co		J. M. Mills, 25 Nassau	500,000			
Isle Royale Copper	Michigan	F. W. Caper, 44 Ex. Place	1,000,000			
Keweenaw Copper	Michigan	F. W. Caper, 44 Ex. Place	500,000			
Lake Superi'r Silver Lead	Michigan	A. S. Kellogg, 22 Pine	1,000,000			
Omiga Copper	Michigan	S. Cooper, 7 Pine	500,000			
Ridge Copper	Michigan	J. L. Gardiner, Jr., 43 Ex. P.	500,000			
Rockland Copper	Michigan	A. Fullerton, 71 B'way	500,000			
St. Joseph Lead	Michigan	J. W. Jones, 6 Broad st.	1,000 000			
St. Marguret Copper		E. P. Sutton, 43 Pine	250,000			
Schoolcraft Copper		R. Walsh, 22 William	500,000			
Superior Copper	Michigan	A. Fullerton, 71 B'way	500,000			
Union Copper		A. S. Kellogg, 22 Pine	500,000			
Vermont Copper	Vermont	J. C. Ely, 191 B'way	500,000			
Wallkill Lead		S. M. Pond, 70 B'way			6	

MISCELLANEOUS.	SITUATION OF MINE.	SECRETARY AND PLACE OF BUSINESS.	CAPITAL.	PAR VALUE.	OFF'R'D.	ASKED.
American Zinc Co		W. E. Lawton, 19 Cliff	$1,000,000			
Bigelow Blue Stone Co		H. Bogardus, 14 Pine				
Quicksilver					13¼	14
Covill B. L. M. & M'f. Co		C. R. Bostwick, 302 Pearl	250,000			
Manhattan Marble		H. K. Gates, 70 B'way	300,000			
N. Jersey Zinc Co	New Jersey	A. B. Farlin, 61 Maiden L'e.	1,500,000			

Lathe Dogs and Clamps.

IN the construction of lathe dogs and carriers it is desirable to make them as light as possible, compatible with the strength required to grip securely and rotate the work to be operated upon, and also to distribute the metal in such a way that it may be balanced, or nearly so, on its centre of rotation when in use. Of the accompanying illustration (FIG. 1) represents a hollow lathe dog, patented by Mr. C. W. LE COUNT, of South Norwalk, Conn., by which it is sought to accomplish these desirable ends. The body of the dog or carrier is cast with a core throughout nearly its entire extent, thus securing a stronger instrument than could be produced by an equal weight of metal in solid form. The metal in the throat, opposite the gripping screw, and around the angle of the tail or carrying end, is so disposed and proportioned as to insure the dog setting square upon the work, and at the same time, to counterbalance the heavier end, give due strength to the parts subjected to the greatest strain, and thus produce a steady rotation. The general form of this dog is not very different from those heretofore in use; but ordinary implements of this class, being subjected to a side-leverage, are liable to bend or twist at the elbow, unless made very heavy; and, when heavy enough to counteract this evil, the weight of metal, rotated with rapid velocity, and not perfectly balanced on its centre of rotation, causes the latter to tremble so as to interfere with the accuracy of the work performed.

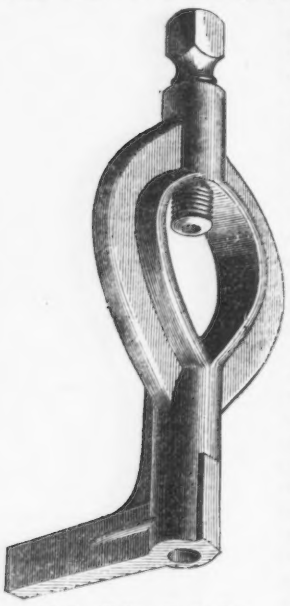


Fig. 1.—*Hollow Lathe Dog.*

It is claimed for the patent hollow lathe dog that, while it offers superior strength and stability, it is so thin that the tool can be used close to the centre; that it is light, and of the best shape to hold; that the screws are hardened in such a way as not to be easily broken; and that they are perfect fits with full thread in the box. These dogs vary in size from three-eighths to four inches. The price of a full set of 12 dogs is $17 30.

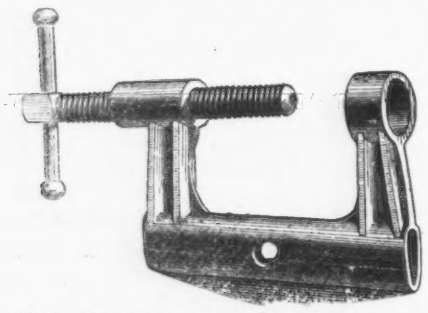


Fig. 2.—*Machinist's Clamp, with Hollow Back.*

Fig. 3.—*Hardened Bolt Dog.*

LE COUNT'S patent machinists'-clamp, with hollow back, is represented in FIG. 2. This is a useful article in the machine shop or smithy, and many other places, as for instance on board a steamship or locomotive, in case of accident requiring small repairs. The screws are long and hardened, a perfect fit, with full thread in the box, and so strong that it is not possible to make them under ordinary circumstances, with the leverage given. The patent hardened bolt dog (FIG, 3) of the same manufacturer, is a neat and strong article, intended for bolting to the face-plate of the lathe for turning bolts, etc. Machinists often make them for themselves of sheet-iron, which is inferior in every way; and the time thus occupied in making a single size might pay for a full set of twelve sizes, five-sixteenths to two inches, which Mr. LE COUNT furnishes at $3. The patent clamp for boiler-makers (FIG. 4) is the same as the machinist's clamp, only much shorter and with longer leverage on the screw. It opens four inches and runs back four inches. The dogs above described have recently been so improved that they have now double their former strength, and may safely be warranted not to break under fair usage.

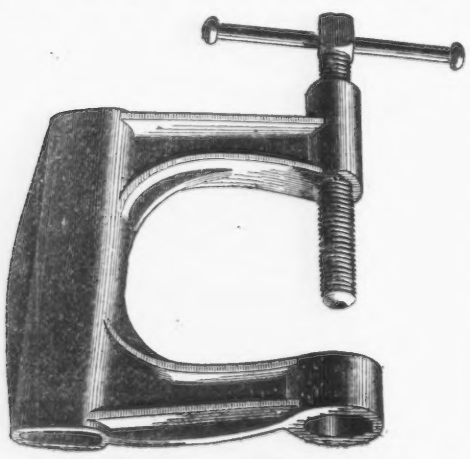


Fig. 4.—*Clamp, with Hollow Back.*

The Gas Companies of London.

MR. E. VAUGHAN RICHARDS, President of the largest gas company in London—the "Imperial"—has been travelling for a considerable time in this country, and, happening to be in Baltimore at a time when the gas question is interesting the inhabitants of that city, writes to the Baltimore *Gazette* an interesting letter on London gas and gas companies. Mr. RICHARDS says there are at present thirteen companies which light the city of London proper, (that is, the small area under the jurisdiction of the Lord Mayor and Alderman) together with "The Metropolitan District;" that is, all London beyond the limits of the city, and it is under the management of "The Metropolitan Board of Works." Of these thirteen companies, the largest is "The Imperial," which in winter carbonizes about fourteen hundred tons (twenty hundred weight of one hundred and twelve pounds to the ton) per diem, and which last winter sent out on its day of largest consumption little short of seventeen million cubic feet of gas. The next company in point of supply is "The Chartered Company," which sends out annually about three-fifths of the quantity supplied by "The Imperial." The other companies are not on so large a scale as the two above mentioned. Up to the year 1858, these several companies were in active competition in various parts of the town, and many streets were supplied from the mains of two or even three companies. This state of things led to incessant opening of the ground for the purpose of laying mains and service pipes, and to search for escapes of gas; the responsibility and expense of which last operation each company sought to repudiate and cast upon its arrival. The complaints of the public were loud and frequent, and, as the existing state of affairs obviously tended to great waste of capital, the companies were as anxious as the consumers to put an end to it. Accordingly, in 1858, the companies agreed among themselves to abandon competition, and to confine themselves each to some particular district of London, of which, by this arrangement, each company would enjoy a monopoly. No sooner was this effected than an outcry arose against the absence of competition, which, it was said, left the consumer entirely at the mercy of the particular company which had selected his district. The agitation which arose led to a long inquiry before a committee of Parliament, and eventually to the passing, in 1860, of an act known as "The Metropolis Gas Act, 1860." The committee decided that it was for the public good that the "districting system" (such was the phrase coined for the occasion) should be maintained, and competition among the gas companies discountenanced; but they also held that the companies invested with this monopoly should be placed under very stringent regulations. Another act of later date, and as yet only applicable to some of the companies affected by the act of 1860, has been passed. Under the joint operation of these two acts of Parliament, any parish can call upon the company within whose district the parish lies to light any street, etc., provided the parish undertakes to erect and maintain lamps at not more than seventy yards apart within such street, etc. Any individual can compel the company to light his premises, if not more than fifty yards distant from any existing main of the company, provided he undertakes to burn gas for not less than three months. The illuminating power of the gas was fixed at what is known as "twelve sperm candles," but this has been increased by the latter act to fourteen sperm candles, and in some cases sixteen. Public officers are appointed whose duty it is to test the illuminating power and report upon it, and heavy penalties are inflicted on the companies for any deficiency in illuminating power, and these penalties are easily enforced. The mode in which the illuminating power is to be tested is accurately defined, but is of too technical a nature to detail here. The quality of the gas prescribed by the act may be appreciated from Mr. R.'s statement, that the gas in New York appears to him be about eleven and one-half or twelve candle gas, and the gas in Baltimore a trifle better. The purity of the gas is a matter strictly regulated by Parliament, and chemical officers are appointed to test the gas three times a day and report upon it. The presence of sulphuretted hydrogen is absolutely forbidden, and not more than twenty grains of sulphur are permitted in one hundred cubic feet of gas. Ammonia is allowed in very minute quantities. These are matters to be appreciated only by chemical readers, but nevertheless of great importance to all consumers of gas. As regards the price of gas, in converting English into American money, one dollar, currency, may be assumed as exactly equal to three shillings, English, which is accurate enough for all practical purposes. The present price of gas in London is four shillings (or one dollar and thirty-three cents) per one thousand cubic feet of fourteen candle-gas; but on the first of January next the quality must be raised by some companies (including the "Chartered") to sixteen candles, and the price reduced by all the companies to three shillings and nine pence (one dollar and twenty-five cents) per one thousand cubic feet. Whether this improvement in quality and reduction in price can be maintained without great distress to the companies, yet remains to be seen. The highest rate of dividend they are permitted by law to pay per annum is ten per cent. on their subscribed capital. Several of them (probably most of them) have done this for the last few years. But the "Chartered" has not been able to do so for some time past, and it is expected will be quite unable to do so when they declare their next dividend in the present month of November. Such being their present position, the recent act of Parliament to which we have already alluded, compels them on the first of January next to increase the quality of their gas by three or four candles, and to reduce the price per one thousand by about nine cents. Whether they can do it, and pay such a dividend as the shareholders are fairly entitled to expect, remains to be seen. The general tenor of Mr. RICHARDS' letter is opposed to the notion that the London companies enjoy a very profitable business.

Russian Railways.

WE are indebted to the correspondence of the London *Times* for a summary of the present extensive railway operations of Russia, as set forth in a recent report submitted to the Czar. This report caused the issue of an imperial ukase, in January, 1869, designating eight lines of railway to be constructed as soon as possible, and denying concessions to any other lines until these are in progress of construction. The aggregate length of these preferred lines is 3236 versts, or about 2145 English miles. The report alluded to commences with a survey of the railway systems of Germany and Austria, encircling the Russian frontier with a network of dangerous strategical facilities. To compete with this formidable railway strength of their neighbors, the Russian generals in the above report proceeded to propose that Warsaw, by direct lines, should be connected with the centre and the south of the empire. Availing themselves of the same favorable opportunity of making proposals, they also added that the State would not be safe unless the same privileges of direct communication by steam with the central provinces were extended to the Crimea, the Caucasus and the Baltic. Not satisfied with this, they demanded two more sets of lines, the one to accelerate the shifting of troops along their old basis on the Düna and Dnieper, the other to carry the irregular cavalry of the Don and Eastern steppes to the Western theatres of war. Some extensions of existing lines completed the comprehensive proposal, which, as will be seen, aims at overcoming distances, and, for the first time in history, placing his immense military strength really at the disposal of the Czar. Detailed proposals are made for attaining the aim in view. As regards the direct communication between Central Russia and Poland, it is asserted that the Vistula frontier, though the most important, is at present the most exposed, of the empire. Projecting far into the Prussian territory and flanking Austria, it must, if properly protected, become a permanent thorn in the side of both; whereas, if insufficiently secured, it offers more facility for attack than defence. It requires artificial protection all the more inasmuch as the distances from Berlin and Vienna to the nearest point on the Russian frontier are respectively 275 and 290 versts, while the Russians, from their ordinary basis at Dunaburg and Kieff, would have to traverse 770 and 960 versts to meet the invader before penetrating into the interior. Yet there is at present but one line linking Russia to Poland—that between St. Petersburg and Warsaw. From the centre and the south of Russia only country roads lead into Poland, which, being useless in these days of rapid strategy, would compel the Russian commanders to send the Moscow, Mohlieff and Kieff garrisons north of Petersburg or Dunaburg, in order to convey them by the fastest route at their disposal east to Poland. But the only western line—the St. Petersburg-Warsaw—which all these transports would have to pass on their way to the scene of action, is anything but safe from the enemy's attack. It is so near to the Prussian frontier that a Prussian army marching up the valley of the Niemen must in two or three days occupy Wilna, and with it the line on whose possession would probably depend the tenure of Poland. To obviate this, two lines are required—from Moscow to Warsaw and from Kieff to Warsaw.

On the Crimean line, a road is proposed from Charkoff, with three branches, terminating at the Sebastopol, Feodosia, and Kertch. Under the plan favored in the report, this important railway will be defended from a western enemy by the course of the Dnieper, and reach the peninsula by crossing the Sea of Azoff, not the Isthmus of Perekop. The Sea of Azoff, it is well known, is navigable only by flat-bottomed boats, and what is less notorious, Kertch, which defends its entrance, has been quietly converted into a first-class fortress. The works, which are nearly finished, are little, if at all, inferior to the once redoubted towers of Sebastopol, and competent to engage cuirassed vessels. A special feature of the new fortress is the cistern for the collection of rain water, built before the artesian wells recently dug proved a success. This cistern is the largest in the world, and capable of holding a supply sufficient to maintain 10,000 men for a year—a quantity which can never be wanted, considering the frequency of rain in the Crimea.

Coal for the Pacific.

THE directors of the Bank of Panama recently received a communication from New Orleans, to the effect that a gentleman of that city would, in from three to four months, be prepared to forward to Aspinwall cargoes of Pittsburgh bituminous coal, sufficient to supply the demands of the Pacific. He purposes carrying on this business in connection with the introduction into the Southern States of Chinese emigrants direct from Hong Kong, by way of Panama. These emigrants the projector will carry from Aspinwall in his own sailing vessels or steamers.

THE ENGINEERING AND MINING JOURNAL.

CONTENTS FOR THIS WEEK.

[*Illustrated Articles are marked with an asterisk.*]

*Low Water Indicator..... 321
Perpetual Motion—A Wicked Machine..... 321
Arctic Explorations..... 321
The Geology of the Lands Lying West of the Mississippi..... 322
Notes from South-Western Virginia..... 322
A Brief Account of the Processes Employed in the Assay of Gold and Silver Coins in the Mint of the United States..... 323
MINING SUMMARY..... 324
MARKET REVIEW..... 324
A National School of Mines.... 327
Cause of Nitro-Glycerine Explosions..... 327
Oscillation of Railway Trains... 327
The Engineering and Mining Journal in Missouri..... 327
Mining Companies and Stock Quotations..... 327
*Lathe Dogs and Clamps..... 328
The Gas Companies of London. 328
Russian Railways..... 328
Coal for the Pacific..... 328
EDITORIALS:
The Rensselaer Polytechnic Institute..... 329
Mineralogy and Mining..... 329
The Great Australian "Diamond" a Quartz Pebble.... 329
Mining Disaster..... 330
ADVERTISEMENTS..... 331

ROSSITER W. RAYMOND, Ph. D., Editor,

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The Rensselaer Polytechnic Institute.

WE rejoice to learn from the papers, that this venerable and justly celebrated school has received by the will of the late General WOOL a legacy of fifteen thousand dollars, which we devoutly trust is not hampered with any conditions whatever, but entrusted to the discretion and wisdom of the management. At any rate, there is reason for pleasure in the gift, small though it be; since such birds fly in flocks, and we may hope for a succession of them, with some strong stragglers to bring up the rear.

No one who has studied the plan and practical operations of the Rensselaer Polytechnic Institute, or is at all familiar with the honorable, often brilliant, record of its graduates, can refuse to admit that, if thoroughness of theoretical instruction happily combined with practical training and judicious discipline, constitute a claim upon pecuniary support, this school need not yield in that regard to any other in the country. Yet, strange to say, among all the technical academies of the United States, this is at once perhaps the most illustrious and the least endowed. It depends almost entirely for support upon the students whom its reputation attracts. We have often thought that in this very fact lies, to some extent, the secret of its efficiency. The higher the character of the school, the wider its fame; the wider the fame, the more numerous the students; and the more numerous the students, the ampler the means for extending the scope and perfecting the machinery of instruction, with a view to still greater usefulness, reputation and success. This intimate connection between actual desert and annual income has no doubt infused a spirit of work into the faculty, the members of which are notably industrious, enthusiastic and thorough in their respective departments. Lazy professors cannot sit in chairs not cushioned with endowments. On the other hand, the necessity of charging full prices for tuition, in order to support the institution, naturally has a good effect upon students. Parents do not send their sons to such schools without weighing the cost and the anticipated gain; and pupils feel the not altogether unworthy motive of a desire to obtain the value of their money.

In fact, there is a certain demoralizing influence exerted upon the public by our prevalent systems of education. Public free schools for elementary instruction are a necessity, because the evils of popular ignorance affect the whole community; and it is a measure of economy and self-protection to tax the property of all citizens in order to make education, up to a certain point, free to all. But an unavoidable result is the cheapening of all education in the public mind, and the general under-payment of teachers. The same unfortunate misconception is extended to institutions of learning; and here it is, we conceive, unnecessarily fostered by an injudicious method of endowments. Rich men, desiring to perpetuate their own names in connection with their benefactions, establish new colleges, or permanently endow new chairs in older ones, according to their own whim; and the result is a sort of superfluous charity, by which the children of wealthy parents are aided when they do not need it, and the poor student is scarcely aided at all. A much fairer and more wholesome method would be to exact the full value of a liberal education from all, both rich and poor, and to employ surplus funds in the direct assistance of needy but promising scholars. Even of the latter, those who have character enough to be likely to make their acquirements subsequently useful to the community would probably prefer to receive such assistance as a loan.

There are certain parts, however, of a system of higher education which require a permanent foundation; and since this is not, in our democratic polity, afforded by the State, it must come from the generosity of citizens. For instance, it is impossible to assess upon the future generations of possible students the original cost of buildings and apparatus of instruction. Libraries and cabinets, together with the expense of their annual maintenance and gradual increase, may well be provided for by permanent endowment.

Again, it is manifestly unjust and impracticable to divide the expenses of an institution in any one year among the students for that year, since the number of the latter may vary from causes entirely foreign to the matter, such as war, or "hard times"; and the necessary result would be, that in some years the same amount of instruction would be twice as dear as in others, or else (the fees remaining the same, but the expenses of the school being contracted to suit the diminished number of students,) the same money would buy but half as much, or half as thorough, instruction. The Rensselaer school unfortunately affords an instance of the latter kind. It is not long since we learned with deep regret that a temporary falling-off in the number of students, occasioned principally by the return home of a score of South Americans, had necessitated not only the abandonment of certain new and promising plans, but the actual discharge of at least one valued instructor.

Finally, there are certain branches which ought to be represented by competent instructors, but which are followed by few men in each generation; and a partial support of these is desirable, while the bread-winning sciences may more safely be left to take care of themselves.

To sum up the whole matter, there is no danger that our colleges and academies will be too richly endowed; but there is danger of injudicious and disproportionate distribution of endowments. If our rich men would give twice as much, and leave the administration of their gifts to the wise and experienced men who direct our institutions of learning, the results would be tenfold more beneficial. We do not desire to see the Rensselaer Polytechnic Institute overlaid with rigid cast-iron legacies, endowing this, that or the other chair; we do not wish it to become a funded fossil, and cease to be what it now is, a living, shining glory to the State of New York; but we do earnestly trust that the liberality of private citizens may provide it with a capital, the income of which may serve as a fly-wheel to the institution, equalizing its activity, lifting it above the minor fluctuations of successive seasons, and preserving in full completeness every part of its admirable organization. The men who have made it a splendid school without aid, are the men who can be trusted to make the most of such assistance. Friend JONES, that twenty thousand of yours will build you but a sorry monument if you undertake to establish with it a JONES College in Jonesville, or a JONES professorship of Common Sense (or some other abstruse thing, your own early and present deficiency in which makes you desirous to be known to posterity in special connection with that particular branch). A happy thought, JONES Leave it—no, don't wait to leave it; *give* it—to some school already established, and noted for wise and successful management. Tell the shrewd old heads who administer the concern to use the annual income of it as they think best; and write a private letter to the President, requesting him to oblige you by making the name of JONES as celebrated as possible in connection with the money. He may call it the JONES Patent Annual Lubricating Fund, or the JONES All-pervading Benefaction, or JONES's Happy Thought. You may trust him to accommodate you in some neat way with the desired immortality, besides securing which, you will also do a deal of good. In fact, JONES, you cannot improve on this plan, except by doubling the figures.

Mineralogy and Mining.

THE science of mineralogy, as distinguished from geology, metallurgy and chemistry, relates only to the various species of inorganic substances occurring in nature. Geology deals with rocks, which are generally composed of several species of minerals; chemistry teaches the constitution of minerals and the elements which enter into them; while metallurgy is the science of extracting from them the products useful to man. Not uncommonly a mere mineralogist is assumed to be a competent mining engineer and metallurgist, which is as if a man who had mastered the "speller and definer" should be considered an author. But the contrary error is not less common, and to this we propose to call attention.

Many mining superintendents, being good business men, mechanics and engineers, affect to despise the knowledge of mineral species and the power to distinguish one from another. In the expressive language of the Pacific coast, the geologist is a "rock-sharp;" the mineralogist, a "crystal-sharp;" the botanist, a "weed-sharp;" the naturalist, a "bug sharp" or a "toad-sharp;" and what the miners require is a "quartz-sharp," or, in other words, a man who understands ores. Now, there is a good deal of hard common sense in this demand. Companies desiring the services of "scientific men" have been too apt to pick up the first that came along, no matter what science they professed. But we wish to put in a respectful plea for the "crystal-sharps," and to assure our practical friends that a "quartz-sharp" who is not at the same time a "crystal-sharp" will be acquainted only with the most frequently occurring ones, and those which he has been accustomed to handle; and even in regard to these, will be too constantly liable to error. Crystalline form, hardness, specific gravity, blow-pipe reactions, and the like simple tests, enable us to distinguish one mineral from another, and to know, without the trouble of repeated analysis, what are its regular constituents, and what are likely to be its accidental ones. This sort of knowledge is well worth having, though the possessors of it need not flatter themselves that they are thereby capacitated to superintend great enterprises, involving other and different qualifications.

A few instances from the history of mining will illustrate how often mineralogy has rendered important assistance, or rather, in most cases, how the want of it has caused serious loss. For it is the mistakes of mining that make the most indelible marks. Folly's monuments have overtopped all others, from the times of Babel down. The useful metal cobalt was for a long time rejected as worthless; and indeed receives its name from the cobolds or malicious sprites of the German mines, who were thought to throw it in the way of the miners in order to tantalize them. Its value was recognized in the sixteenth century; yet in very recent times it was included in the refuse of the Wheal-Sparrow mine in Redruth, Cornwall, and only the gradual decline of the copper product of the mine, leading to a thorough examination by competent mineralogists, revealed the fact that a mineral more valuable than copper had been persistently thrown away for years. As an offset to this case, we may cite another, in which England was the first discoverer, and Germany played the part of disgraceful stupidity. The celebrated black-band iron ores of the carboniferous formation have been for a long period the principal material for the manufacture of iron in certain parts of Great Britain; yet down to a very recent day (and possibly even at the present time) these magnificent ores were thrown away in Westphalia as "slate." It is not many years since a mass of rich black copper ore was discovered in the Tavistock mines, which the workmen had left standing as a "pillar" of worthless material, "because it looked different from the good ore." HUMBOLDT mentions the ignorance of some of the Spanish miners in Mexico, who left unnoticed upon their waste-dumps, and even built into the walls of the town of Micuipampa, large fragments of the richest silver ores, which they failed to recognize as valuable. In like manner, the miners of Transylvania for some time conceived their rich telluric gold ores to be merely specular iron. The white lead ores of Derbyshire, the calamine ores of Poland, and in our own country, the silver ores of the Comstock ledge, the antimony of the ores of Oreana, and numerous other valuable minerals have suffered a similar fate. No doubt there are many such misconceptions still existing among us.

On the other hand, the instances are perhaps still more numerous, in which, for the want of a little mineralogical knowledge, worthless substances have been mistaken for precious or useful ores. Thus the zinc blende of England has been taken, now for iron ore, now for galena, and attempts have been made to smelt it in furnaces; common lime has been shipped as barytes; bituminous slates have been mined for coal; asphaltum has been considered petroleum.

One of the most striking instances of this kind is furnished by the early history of Virginia. In the second year, if we remember our school-book rightly, of the colony at Jamestown, there arose a great excitement over the discovery of gold. The historians relate that the whole colony abandoned its crops and regular occupations, and loaded one or two ships with glittering mica, which being pronounced worthless by the jewellers of England, the Jamestown folks thereupon enjoyed a strong "reaction," pleasantly enforced by a famine. We consider it extremely probable that gold *was* discovered at that time, since the micaceous slates of the interior contain gold, and the metal might have been brought in by the Indians, or found by adventurous hunters and scouts. But this supposition only increases the astonishment with which we must regard the folly of the colonists, who were not able to distinguish gold from mica, even though they had the means of comparing them in weight, lustre, form and hardness. The immortal John Smith (may his name never die out!) is said to have "beared" the gold stock from the beginning, but not on mineralogical grounds.

The Blackrock episode in Nevada will occur to many as a forcible illustration of this train of thought. But we have written enough about that story on other occasions; and we trust the cases already cited will sufficiently support our assertion that mineralogy is not to be despised even by the most "practical" miner. If we add that it is one of the most delightful and least difficult of studies—unless the student goes thoroughly into mathematical crystallography and chemistry, which are not absolutely necessary to a tolerable acquaintance with minerals—we furnish an additional reason for the pursuit of this science to every miner.

The Great Australian "Diamond" a Quartz Pebble.

The great Armidale diamond has turned out to be a great sell. After being secluded from the public gaze till a considerable popular excitement had been got up, it was at last submitted to the inspection of a competent geologist, and after a few simple tests it was soon pronounced to be no diamond at all, but simply a water-worn quartz pebble. Previously to this discovery, however, and while the real nature of the stone remained a mystery, it had become an object of sale and speculation. A company had been organized in Melbourne for its purchase, and a certain sum given for it, with a further right to a share in its ultimately realized value. By dint of the ordinary means for getting up excitement, the shares were rushed to a high premium, the knowing ones cleared out, and the captured geese were plucked. The whole affair is an illustration of the ease with which people are duped, and of the prevalence of the gambling spirit. That there are certain districts in Victoria and New South Wales, whose geological character justifies the expectation of finding diamonds there is undeniable, and it is equally true that some small diamonds have already been found. There is a probability, therefore, that a careful, systematic, and prolonged search might give such an average of success as to pay a fair interest on capital judiciously invested; but there is nothing at present to warrant the expectation of any immense fortunes to be made by diamond hunting. Certainly, there is nothing to indicate that on the whole it will prove a more profitable occupation than gold digging.—*Australian Mining Record.*

Mine Disasters.

THE following is a list of the greatest mine disasters on record: Fourteen killed at Carbondale, Pa., by the caving in of forty acres of a mine in 1841. Five bodies were never recovered. One man was two days in the mine. Two hundred and nine killed at Hartley colliery, England, in 1862; three hundred and fifty-seven at the Oaks, in 1868; thirteen at Diamond mine, Scranton, Pa., March 31, 1868; fifty-three at Ferndale colliery, Wales, June 10, 1868; fifty-three at St. Helen's colliery, July, 1868; fifty at colliery explosion, Jemappes Belgium, August 10, 1868: twenty-eight at Lancashire, England, 1868; three hundred and twenty-one at a mine near Dresden, Saxony. August 28, 1869; one hundred and ten at Avondale, Pa., September, 1869.

Paddle v. Screw.

A STRIKING instance of the proper distribution of steam-power has been exemplified in a steamer recently altered at the port of Greenock. The vessel in question was a paddle-steamer of 350 horse-power, with cargo space for 400 tons of goods. Her consumption of fuel was 24 tons a day, and her speed 7½ knots. She was converted into a screw-steamer, and fitted with a twin propeller, and the consequence has been that with engines of 75 horse-power she steams at the rate of 10½ knots, and carries 800 tons of cargo, with a daily consumption of about 8 tons of coal only.—*London Artizan.*

A Paying Mine.

ACCORDING to a late number of the Grass Valles *Union*, the Union Hill mine produced in September, $10,500. The mine is said to be doing better than paying its way.

MISCELLANEOUS.

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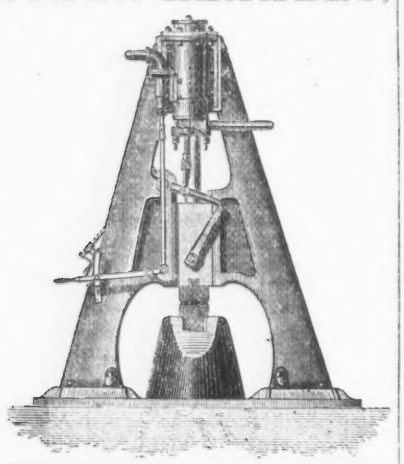

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CONTENTS:

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REPORT:

PART I.—Observations of the present condition of the mining industry:

SECTION I.—*Notes on California:*
Chapter I.—The new Almaden mines.
II.—The Mother Lode of California.
III.—The quartz and placer mines of Nevada County.
IV.—Giant powder and common powder.

SECTION II.—*Notes on Nevada:*
Chapter V.—Present condition and prospects of the Comstock mines.
VI.—Ormsby, Washoe, and Churchill Counties.
VII.—Lander County.
VIII.—Nye County.
IX.—Lincoln County.
X.—Esmeralda County.
XI.—Humboldt County.

SECTION III.—*Notes on Montana:*
Chapter XII.—General geological features.
XIII.—Population, property, railroad, etc.
XIV.—Placer mines.
XV.—Quartz mines.
XVI.—Operations of the United States law.

SECTION IV.—*Notes on Idaho:*
Chapter XVII.—Report of Mr. Ashburner.
XVIII.—The War Eagle tunnel.
XIX.—Bullion product.

SECTION V.—*Notes on other mining fields:*
Chapter XX.—Arizona.
XXI.—Utah.
XXII.—The Isthmus of Panama.

PART II.—The relations of government to mining:
Introduction.

SECTION VI.—*Mining law.*
Chapter XXIII.—Mining and mining law among the ancients.
XXIV.—Mining law in the middle ages.
XXV.—The Spanish mining law.
XXVI.—Modern German codes.
XXVII.—The code of France.
XXVIII.—Mining law of Switzerland.
XXIX.—Mining law of England.
XXX.—Mining regulations of Australia.
XXXI.—Mining laws of Canada.
XXXII.—Conclusions.

SECTION VII.—*Mining Education:*
Chapter XXXIII.—Means of disseminating information with regard to mining and metallurgy; the National School of mines.

SECTION VII.—*Mining Education—Continued.*
Chapter XXXIV.—The Freiberg School of Mines.
XXXV.—The Paris School of Mines.
XXXVI.—The Prussian School of Mines.
XXXVII.—The School of Mines at Clausthal.

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" Splitting of (plans)
" One current of (plans)
" One current of, and how to adopt separate currents (plan)
" Dividing of, but not into "separate and and distinct" current (plans)
" Crossings (see H on plans)
" Weight of in shafts
" How to find the weight of
" Table of pressure in shafts
" Expansion of
" Its velocity and force
" Rush of, into each division
" Quantity produced by natural ventilation
" Splitting, why it should be adopted
" Splitting, why the workmen object to Mr. Hopton adopting the mode
Anemometer, measurement of air by, engraving of
Area of a pit, how to find
Barometers, Showing the time of an outlet of gas in mines (engraving)
Bricks, how to find the number in the walling of a shaft.
Buddle's plan
Circumference of a pit, how to find
Coal, several ways of working it out, and why man methods of working it out are adopted
" Working out in banks (plans)
" Working it out in following up banks (plan)
" Working out in pillars (plans)
" Working out in long wall (plans)
" Working out in drifts (plans)
" Working out with no regularity (plan)
" Working out by the "end way" or in endings (plan)
Cubical Contents of a pit, how to find
Dialing, the mode of
Dials, several engravings
" How constructed
" How fixed in mine surveying
" Needle, its variations
Diameter of shaft
Dip of mine, how to find and lay on (plan)
Explosion, the power of an
" At Lund-hill, in what part of the mine it was supposed to take place (plan)
" How the power may be diminished
Furnace, how to find the horse-power of
" The place of fixing, to produce the largest ventilating current
" Engravings of ground floor, front and back view
" Remarks upon
Gases, (carbonic acid) composition of
" Do. properties of
" (After, or choke damp) composition of
" (Carburetted hydrogen) do.
" Choke damp and carbonic acid, not one and the same in quality
" The effect produced on people by inhaling such
" The quantity required for an explosive mixture
" The elasticity of
" The weight of
" The nature and quality of
" Why some mines generate and produce more than others
" Why some mines generate a mixture of
Goaf, or gob, how tramrods are made through (plan)
Lund-hill (plan)
Managers, who are best competent to manage mines
Miscellaneous questions
Natural ventilation
Planning, how workings are laid on the plan
Regulations (see R on plans)
Safety Lamps, why flame will not penetrate through, engraving of
Sections on mechanical ventilation
Summary of accidents
Surveying, how mines are with the dial
Surveying, how mines are with the theodolite
Tables of weights and measures
Temperature on surface
Temperature in mines
Temperature, difference of between down and up-cast
Theodolites for mine surveying
Theodolites, how constructed
Theodolites, the magnetic needle dispensed with, and how workings are laid on plan, with Theodolite surveying
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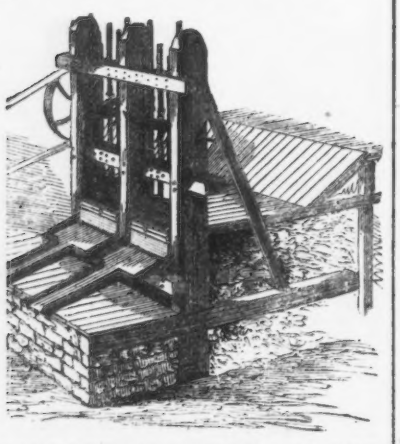

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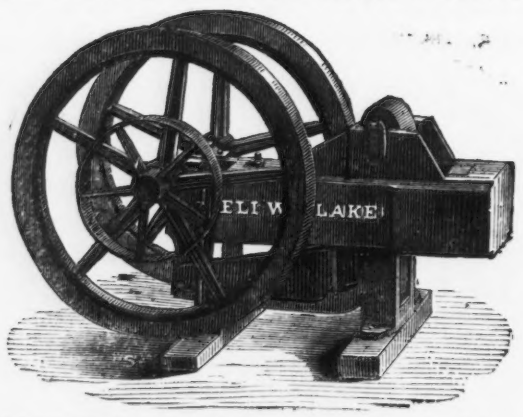

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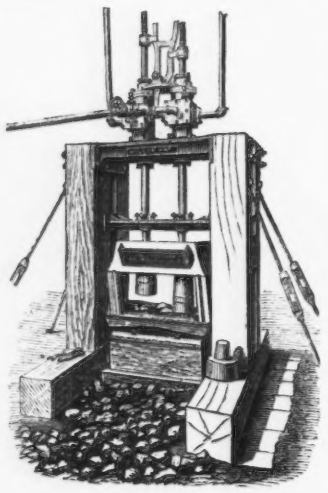

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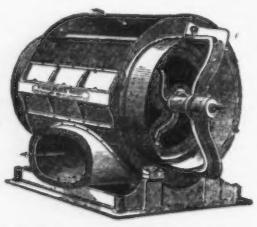

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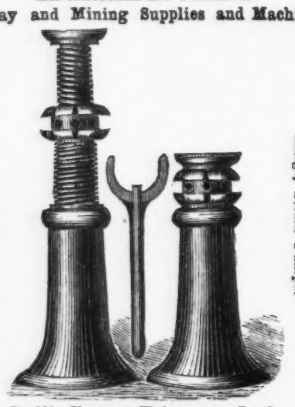

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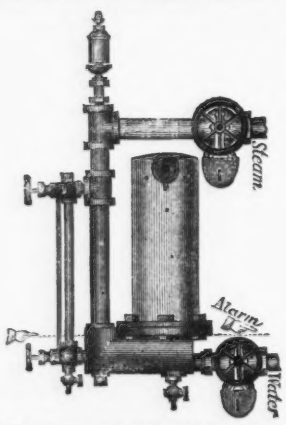

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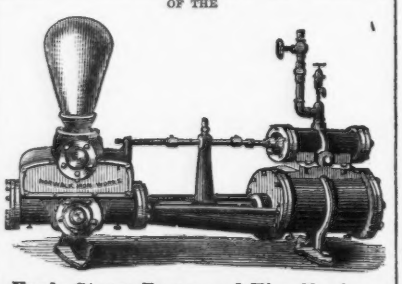

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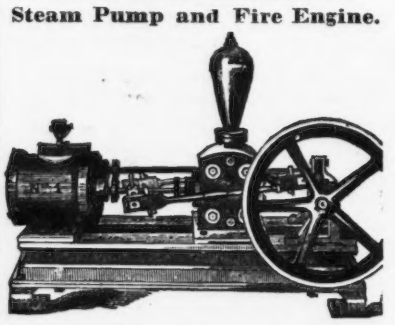

STEAM, WATER, AND GAS FITTINGS OF ALL KINDS.

Also dealers in WROUGHT IRON PIPE, BOILER TUBES, etc. Hotels, Churches, Factories, and Public Buildings, heated by Steam, Low Pressure.

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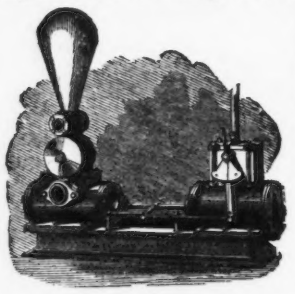
Niagara Steam Pump Works.

FIRST PREMIUM AMERICAN INSTITUTE, 1867.



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Steam Pump and Fire Engine.

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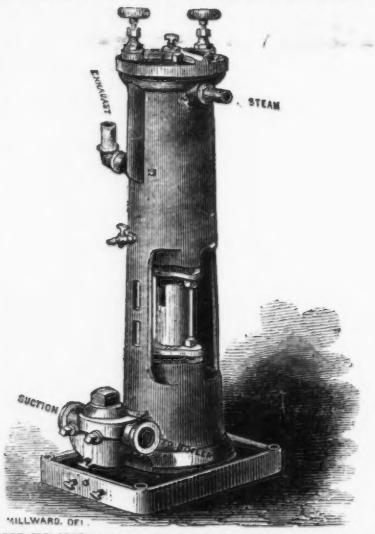

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RELIABLE FOR HOT OR COLD WATER.

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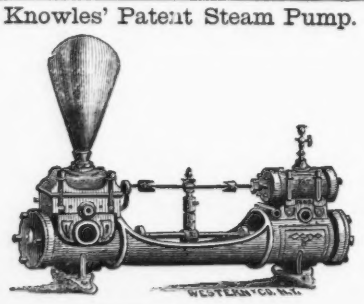

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Air Pumps, Blowing Engines, Hydraulic Pressure Pumps, New Locomotive Pumps, Fire Pumps, Boiler, Feed, Marine, Drainage, Sugar-work, Brewery, Distillery, Oil and Wrecking Pumps.

Improved Horizontal and Vertical

MINING PUMPS

(Working with Plungers, and especially arranged for pumping water containing dirty or gritty matter.)

Pumps for every possible duty, and all fully guaranteed. Also,

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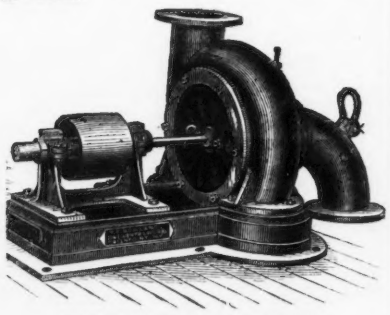

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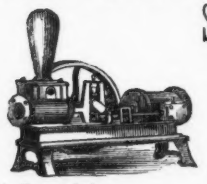

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These pumps are the cheapest first-class pumps in the market.

All sizes made to order at short notice.

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Steam Pumping Engines, Single and Duplex, Worthington's Patent, for all purposes, such as Water Works Engines, Condensing or Non-condensing; Air and Circulating Pumps, for Marine Engines; Blowing Engines; Vacuum Pumps, Stationary and Portable Steam Fire Engines; Boiler Feed Pumps, Wrecking Pumps,

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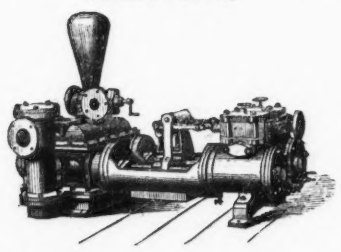

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Engines ranging from 15 h. p. to 1,000 h. p.,

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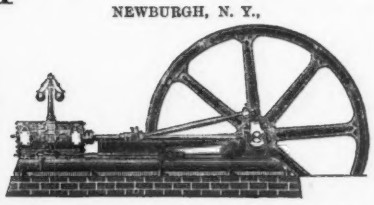

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MARINE ENGINES AND BOILERS
of all descriptions, HIGH AND LOW PRESSURE;

PUMPING ENGINES.

for WATER WORKS, warranted to give the LARGEST DUTY with the smallest consumption of fuel.

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PATENT WATER-METER.

This Meter is also Used for the Measurement of Oil.

IT COMBINES

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with such ease and certainty of motion as to offer no appreciable obstructions to the flow of water in the pipes to which it is connected, as it runs and registers upon three inches head, or when delivering the smallest stream. These qualities, with its low cost, have caused its extensive adoption by corporations and individuals, in many of our larger cities.

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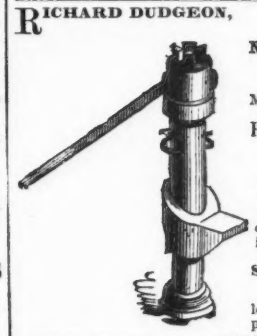

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William Wright's Patent Variable Cut-Off Steam Engine, regulated by the Governor. Merrick's Safety Hoisting Machine, Patented June, 1868. David Joy's Patent Valveless Steam Hammer. D. M. Weston's Patent Self-Centering, Self-Balancing Centrifugal Sugar Draining Machine, and Hydro Extractor for Cotton and Woolen Manufacturers. nov15-1y

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OSCILLATING ENGINES, run at great speed. Sizes 1-2 to 250 Horse-Power.

SMOKE-BURNING AND SUPER-HEATING BOILERS are economical and Safe.

CENTRIFUGAL PUMPS, pass Sand, Coal, Corn, Gravel, etc., without injury. Capacity 90 to 40,000 gallons per minute.

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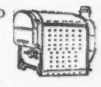
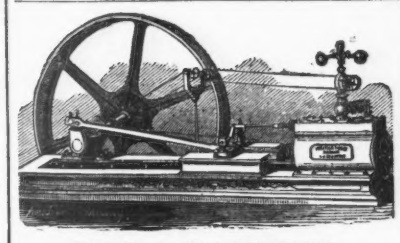


Address Manufacturers

WM. D. ANDREWS & BRO.,

july 1 1-y 414 Water street, New York.



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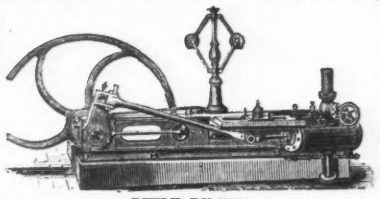

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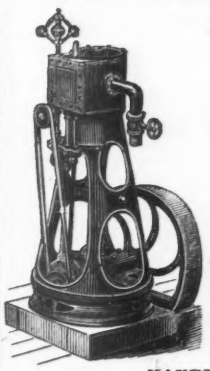

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Also, BOILERS, TANKS, and CASTINGS, of all descriptions. nov 2:1y

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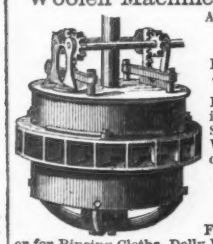

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Regulators, Elevators, Shafting, Gearing, Pulleys, Gate Screws for Hoisting Gates, Woodworth's Planing Machines, Grist Mills, etc., etc.

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Also Iron Founders. Every description of Casting furnished at short notice. All Machines and Castings furnished at this establishment warranted.

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THE STEAM GENERATOR

Manufacturing Company of Penn.

This Company is now prepared to furnish

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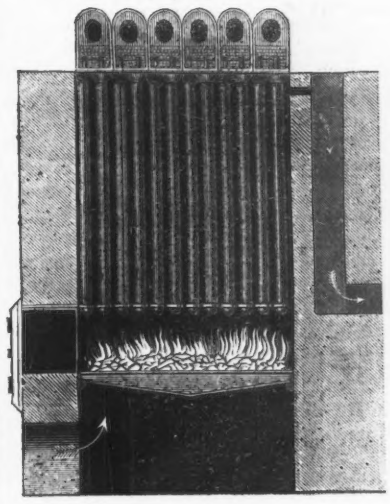

Patent Improved Steam Generator,

Of any power required, upon two weeks' notice. They have been introduced in this city and thoroughly tested, with most satisfactory results, and are sold under Guarantee of Absolute

Safety from Destructive Explosion.

They are cheaper in first cost and in expense of erection, more economical in fuel, durable and convenient in use, than any other apparatus for generating steam. For Mining purposes it is unequalled, owing to the facility with which it can be transported and erected.

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N. B.—Boilers inspected and repaired in the best manner and at short notice.

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CIRCULAR SAWS WITH EMERSON'S PATENT MOVEABLE TEETH.

These Saws are meeting with unprecedented success, and their great superiority over every other kind, both as to efficiency and economy, is now fully established

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(All Gumming avoided,) and

EMERSON'S PATENT ADJUSTABLE SWAGE,

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BAND SAWS, ROTARY BED PLANERS,

Matching Machines, Moulding Machines, Saw Benches, Chair Lathes, Self-Oiling Pulleys, etc.

june5-tf FITCHBURG, MASS.

RAILROADS.

LEHIGH & SUSQUEHANNA RAILROAD.
(LEHIGH COAL AND NAVIGATION CO.)

Summer Arrangement.

On and after Monday, July 12, 1869, Passenger Trains on the Lehigh & Susquehanna Railroad will run as follows:

DOWN TRAINS.

	No. 1. A.M.	No. 3. A.M.	No. 5 P.M.	No 7. P.M.
Leave Green Ridge	9:05	7:00	1:00	5:15
Scranton	9:10	7:05	1:05	5:20
Pittston	9:36	7:35	1:35	5:52
Wilkesbarre	10:00	8:00	2:00	6:17
White Haven	11:23	A.M.	P.M.	P.M.
				No. 9.
Mauch Chunk	12:00			A.M.
	1:03			6:50
Catasauqua	2:01			8:04
Allentown	2:10			8:15
Bethlehem	2:20			8:30
Easton	2:48			9:05
Phillipsburg	2:52			9:10
Philadelphia	4:45			A.M.
Arrive New York	6:30 C.R.R.			
	9:40 M. & E.R.R.			
	P.M.			

UP OR NORTHWARD TRAINS:

	No. 2. P.M.	No. 10 A.M.
Leave New York	9:00 C. R. R.	
	8:30 M. & E. R.R.	
Philadelphia	9:45	
Phillipsburg	11:50	7:00
Easton	11:55	7:04
Bethlehem	12:23	7:36
Allentown	12:36	7:50
Catasauqua	12:53	8:04
Mauch Chunk	2:05	9:20

	No. 4. A.M.	No. 6. P.M.	No. 8. P.M.
White Haven	3:23	P.M.	P.M.
Wilkesbarre	5:00	8:30	2:25	6:45
Pittston	5:25	8:55	2:50	7:10
Scranton	5:56	9:26	3:20	7:40
Arrive Green Ridge	6:00	9:30	3:25	7:45
	P.M.	A.M.	P.M.	P.M.

Connections.

DOWN TRAIN No. 1, makes close connection at Penn Haven with Lehigh Valley Railroad, for Beaver Meadow, Hazleton and Mahanoy City.

DEL. & HUDSON CANAL CO., R.R.—Up trains Nos. 4 & 6, and down trains Nos. 1 and 7 connect at Green Ridge with trains on Delaware & Hudson Railroad, to and from Carbondale.

NORTH PENNA. R.R.—Down train No. 1, and up train No. 0 connects at Bethlehem with trains on North Pennsylvania R.R, arriving at Philadelphia at 4:45 P.M. Returning, leave Philadelphia for Scranton, Wilkesbarre and Mauch Chunk at 9:45 A.M.

LEHIGH & LACKAWANNA R.R.—Down train Nos. 1 and 0, and up train Nos. 2 and 0 connect at Bethlehem with Lehigh & Lackawanna R. R. for Bath and Chapman Quarries. Returning leaves Bath at 7:00 A.M.

MORRIS & ESSEX R. R.—Down train No. 1 and 0 connect at Easton with Morris & Essex Railroad for Newark and New York. Returning leave New York (foot of Barclay street,) for Scranton, Wilkesbarre and Mauch Chunk at 8:00.

CENTRAL RAILROAD OF NEW JERSEY.—Down trains Nos. 1 and 9 connect at Phillipsburg with trains for New York. Returning, leave New York (foot of Liberty street,) for Scranton, Wilkesbarre and Mauch Chunk at 9:00 A. M.

BELVIDERE & DELAWARE R.R.—Down train No. 0 and up train No. 2 connect at Phillipsburg with Belvidere & Delaware Railroad to and from Trenton and Philadelphia.

MENDES COHEN,
Superintendent.

LEHIGH VALLEY RAILROAD.

—ON AND after June 1, 1869, trains on the Lehigh Valley Railroad will run as follows:

DOWN TRAINS.

	A.M	P.M.
Leave Tunkhannock	6.20	
L. & B. Junction	7 30	1.15
Pittston	7.49	1.25
Wilkesbarre	8.00	1.45
White Haven	9 25	3.08
Mauch Chunk	10.35	4.20
Allentown	11.43	5.50
Bethlehem	11.55	6.05
	P.M.	
Easton	12.25	6.35
Philadelphia	2.10	8.35
Arrive New York	3.50	9.00

UP TRAINS.

	P. M.	M.
Leave New York	6.50	12.00
		P. M.
Philadelphia	7.45	1.45
Easton	10.00	3.25
Bethlehem	10.30	4.00
Allentown	10.45	4.20
	M.	
Mauch Chunk	12.00	5.45
	P. M.	
White Haven	1.32	7.18
Wilkesbarre	2.50	8.35
Pittston	3.10	8.55
L. & B. Junction	3.29	9.05
Arrive Tunkhannock	4.30	

☞ No change of cars between Scranton and New ork, or between Scranton and Philadelphia.

ROBERT H. SAYRE, Sup't and Eng.
H. STANLEY GOODWIN, Ass't Gen. Supt.
June 1, 1869.

DELAWARE, LACKAWANNA & WESTERN R. R.—Morris & Essex Division.

Summer Arrangement,

Commencing Monday, April 5, 1869, and running on the following time until further notice.

	L. and Express. A. M.	Scranton. Mail. A.M.	Scranton. Express. P. M.
Leave Easton	6.55	11.30	5.30
Washington	7.28	12.10	6.15
Hackettstown	7.48	12.36	6.45
Dover	8.30	1.24	7.30
Rockaway		1.34	
Morristown	9.00	2.00	8.00
Orange		2 50	8.50
Newark	9.50	3.00	9.00
Arrive New York	10.25	3 35	9.40
	A.M.	P. M.	P.M.

RETURNING.

	P. M.	A. M.	A.M.
Leave New York	4.00	7.00	8.30
Newark	4.40	9.05	7.40
Orange			7.53
Morristown	5.33	10.00	8.45
Rockaway			9.09
Dover	6.00		9.20
Hackettstown	6.42	11.05	10.08
Washington	7.02	11.25	10.33
Arrive Easton	7.35	11.57	11.10

Connections.

At Washington, with Delaware, Lackawanna & Western Railroad, for Water Gap, Stroudsburg, Wilkesbarre, Carbondale, Scranton and Great Bend.

At Easton, with Lehigh Valley and Lehigh & Susquehanna Railroads for Bethlehem, Allentown, and Mauch Chunk.

S. SCHOCH,
Ass't Superintendent.

R. A. HENRY,
Gen. Passenger Agent.

Hoboken, N. J., April 21, 1869.

RAILROADS.

READING RAILROAD.

—GREAT TRUNK LINE from Philadelphia to the interior of Pennsylvania, the Schuylkill, Susquehanna, Cumberland and Wyoming Valleys, the North, Northwest, and the Canadas.

Summer Arrangement of Passenger Trains, July 12, 1869.

Leaving the Company's Depot, Thirteenth and Callowhill streets, Philadelphia, at the following hours:

MORNING ACCOMMODATION.

At 7.30 A.M. for Reading and all intermediate stations and Allentown. Returning, leave Reading at 6.30 P. M., arrive in Philadelphia 9.15 P.M.

MORNING EXPRESS.

At 8.15 A. M., for Reading, Lebanon, Harrisburg, Pottsville, Pinegrove, Tamaqua, Sunbury, Williamsport, Elmira, Rochester, Niagara Falls, Buffalo, Wilkesbarre, Pittston, York, Carlisle, Chambersburg, Hagerstown, &c.

The 7.30 A. M. train connects at READING with East Pennsylvania Railroad trains for Allentown, &c., and the 8.15 A.M. train connects with the Lebanon Valley train for Harrisburg, &c.; at PORT CLINTON with the Catawissa Railroad trains for Williamsport, Lock Haven, Elmira, &c.; at HARRISBURG with Northern Central, Cumberland Valley, and Schuylkill and Susquehanna trains for Northumberland, Williamsport, York, Chambersburg, Pinegrove, &c.

AFTERNOON EXPRESS

Leaves Philadelphia at 3.30 P.M. for Reading, Pottsville, Harrisburg, &c., connecting with Reading and Columbia Railroad trains for Columbia, &c.

POTTSTOWN ACCOMMODATION

Leaves Pottstown at 6.25 A.M., stopping at intermediate stations; arrives in Philadelphia at 8.40 A. M. Returning, leaves Philadelphia at 4.30 P. M., arriving in Pottstown at 6.40 P.M.

READING ACCOMMODATION

Leaves Reading at 7.30 A.M., stopping at all way stations; arrives in Philadelphia at 10.15 A.M.

Returning, leaves Philadelphia at 5.15 P. M.; arrives in Reading at 8.00 P.M., and connects with Market Train for Pottsville.

Trains for Philadelphia leave Harrisburg at 8.10 A.M. and Pottsville at 8.45 A.M., arriving in Philadelphia at 1.00 P.M. Afternoon trains leave Harrisburg at 2.05 P. M. and Pottsville at 2.45 P.M., arriving at Philadelphia at 6.45 P. M.

HARRISBURG ACCOMMODATION

Leaves Reading at 7.15 A.M. and Harrisburg at 4.10 P.M. Connecting at Reading with Afternoon Accommodation south at 6.30 P.M., arriving in Phildelphia at 9.15 P. M.

MARKET TRAIN, with a passenger car attached, leaves Philadelphia at 12.45 P. M. for Pottsville and all way stations; leaves Pottsville at 5.40 A.M., connecting at Reading with Accommodation Train for Philadelphia and all way stations.

All the above trains run daily, Sundays excepted.

Sunday trains leave Pottsville at 8.00 A.M. and Philadelphia at 3.15 P. M.

Leave Philadelphia for Reading at 8.00 A.M. Returning from Reading at 4.25 P.M.

CHESTER VALLEY RAILROAD.

Passengers for Downingtown and intermediate points take the 7.30 A.M., 12.45 and 4.30 P.M. trains from Philadelphia, returning from Downingtown at 6.10 A.M., 1.00 and 5.45 P.M.

PERKIOMEN RAILROAD.

Passengers for Skippack take 7.30 A M., 4 30 and 5.15 P.M. trains from Philadelphia; returning from Skippack at 6.15, 8.15, A. M. and 1.00 P. M. Stage lines for various points in Perkiomen Valley connect with trains at Collegeville and Skippack.

NEW YORK EXPRESS, FOR PITTSBURG AND THE WEST.

Leaves New York at 9.00 A. M. and 5.00 and 8.00 P.M., passing Reading at 1.05 A.M., and 1.50 and 10.19 P.M., and connecting at Harrisburg with Pennsylvania and Northern Central Railroad Express Trains for Pittsburg, Chicago, Williamsport, Elmira, Baltimore, &c.

Returning, Express Train leaves Harrisburg on arrival of Pennsylvania Express from Pittsburg at 2.35 and 5.20 A. M., 10.55 P. M. passing Reading at 4.30 and 7.05 A. M. and 12.50 P. M.; and arriving at New York at 11.00 A. M. and 12.20 and 5.00 P. M. Sleeping cars accompany these trains through between Jersey City and Pittsburg without change.

A mail train for New York leaves Harrisburg at 8.10 A.M. and 2.05 P. M. Mail train for Harrisburg leaves New York at 12 noon.

SCHUYLKILL VALLEY RAILROAD.

Trains leave Pottsville at 6.30 and 11.30 A. M. and 6 40 P.M., returning from Tamaqua at 8.35 A. M. and 2.15 and 4.15 P.M.

SCHUYLKILL AND SUSQUEHANNA RAILROAD.

Trains leave Auburn at 6.25 A. M. for Pinegrove and Harrisburg, and at 12.10 P.M. for Pinegrove and Tremont; returning from Harrisburg at 6.20 P. M., and from Tremont at 6.45 A.M. and 7.40 P.M.

CENTRAL RAILROAD OF NEW JERSEY.

—Passenger and Freight Depot in New York, foot of Liberty street; connects at Hampton Junction with the Delaware, Lackawanna and Western Railroad, and at Easton with the Lehigh Valley Railroad and its connections, forming a direct line to Pittsburgh and the West without change of cars.

ALLENTOWN LINE TO THE WEST.

Three Express Trains to the West, except Sundays, when one train in the evening.

Sixty miles and three hours saved by this line to Chicago, Cincinnati, St. Louis, &c., with but one change of cars.

Silver Palace cars through from New York to Chicago.

SUMMER ARRANGEMENT.

Commencing August 16, 1869.—Leave New York as follows:

6.55 A. M.—For Easton, Bethlehem, Mauch Chunk, Williamsport, Wilkesbarre, Mahanoy City, Tukhannock, 7.15 A. M.—For Somerville.

8.30 A. M.—For Flemington, Junction, Stroudsburg, Water Gap, Scranton, Kingston, Pittston, Great Bend, 9 A. M.—WESTERN EXPRESS.—For Easton, Allentown, Harrisburg and the West, without change of cars to Cincinnati or Chicago, and but one change to St. Louis. Connects at Harrisburg for Erie and the Oil Regions. Connects at Junction for Stroudsburg, Water Gap, Scranton, &c. Connects at Phillipsburg for Mauch Chunk, Wilkesbarre, &c.

12 M.—For Flemington, Easton, Allentown, Mauch Chunk, Wilkesbarre, Reading, Columbia, Lancaster, Ephrata, Litiz, Pottsville, Scranton, Harrisburg, &c.

3.30 P. M.—For Easton, Allentown, Mauch Chunk and Belvidere.

4.30 P. M.—For Somerville.

5.00 P. M.—CINCINNATI EXPRESS.—For Easton, Bethlehem, Allentown, Reading, Harrisburg, Pittsburgh, Chicago and Cincinnati. Sleeping Cars to Pittsburgh and Chicago. Connects at Junction with Delaware, Lackawanna and Western Railroad for all Stations to Scranton.

5.25 P. M.—For Somerville and Flemington.

6 P. M.—For Easton and intermediate stations.

7.00 P. M.—For Somerville.

8.00 P. M.—WESTERN EXPRESS TRAIN.—For Easton, Allentown, Reading, Harrisburg, Pittsburgh and the West—connects at Harrisburg with train for Williamsport, Erie, &c.

8.10 P. M.—EMIGRANT—Stopping only at principal stations.

9.00 P. M.—For Plainfield.

11.45 P. M.—For Plainfield on Wednesdays and Saturdays only.

Sleeping cars through from Jersey City to Pittsburgh every evening.

Trains leave for Elizabeth at 5.45, 6.30, 6.55, 7,15, 8.15, 8.30, 9.00, 9.20, 10.30, 11.40 A. M., 12.00 M., 1.00, 2.00, 3.00, 3.30, 3.45, 4.15, 4.30, 4.45, 5.10, 5.25, 5.45, 6.00, 6.25, 7.00, 7.45, 8.00, 8.10, 9.00, 9.45, 10 45, 11.50 P. M.

Tickets for the West can be obtained at the office of the Central Railroad of New Jersey, foot of Liberty street, N. Y.; at No. 1 Astor House; Nos. 254, 271, 526 Broadway; at No. 10 Greenwich street, and at the principal hotels. R. E. RICKER, Superintendent.

H. P. BALDWIN, Gen. Pass. Agent.

RAILROADS.

MORRIS AND ESSEX RAILROAD.

—DELAWARE, LACKAWANNA AND WESTERN RAILROAD CO. (Lessees). Depots in New York, foot of Barclay street and foot of Christopher street.

Summer arrangements, commencing MONDAY, May 10, 1869.

8.00 A. M.—MAIL TRAIN.—Connecting at Denville with Boonton Branch, at Dover with Chester Branch, at Waterloo with the Sussex Railroad for Andover and Newton, at Washington with the D. L. and W. Railroad for Water Gap, Stroudsburg, Scranton, and Great Bend, and all points on the Lackawanna and Bloomsburg, and Delaware and Hudson River Railroad; at Easton with the Lehigh and Susquehanna Railroad for Bethlehem, Allentown, Mauch Chunk, and Wilkesbarre.

11.30 A. M.—LEHIGH VALLEY EXPRESS—Stops at Newark, Morristown, Dover, Hackettstown, Washington, Phillipsburg, and Easton; connects at Phillipsburg with Bel., Del. Railroad for Belvidere, &c., and at Easton with L. V. R. R. for Bethelehem, Allentown, Mauch Chunk, and Wilkesbarre.

4.00 P. M.—SCRANTON EXPRESS—Connects at Washington with the D. L. & W. R. R. for Water Gap, Stroudsburg, and Scranton at Dover with Chester Railroad, and at Waterloo with Sussex Railroad.

6 30 A. M. and 4.30 P. M.—To Summit and intermediate stations.

6.30, 7.30, 9,30 A. M., and 1.00, 3.40, 5.30, 8.45, 11.45 P. M.—To South Orange and intermediate stations.

11.40 A. M., 3.00 and 6.30 P. M.—To Morristown and intermediate stations.

5.10 P. M.—Morristown Express.

For Newark at 6.30, 7 30, 8.00, 8.30, 9.30, 10.30, 11.00, 11.30, 11.40, A. M., 1.00, 2.00, 3.00, 3.30, 3.40, 3.50, 4.00, 4.30, 5.00, 5.10, 6.10, 6.30, 7.45, 8 45, and 11.45 P. M.

For Bloomfield and Montclair—At 8 30, 11.00 A. M.; 2.00, 3.50, 5,00 and 6.10 P. M.

S. SCHOCH, Assistant Superintendent,
R. A. HENRY, G. P. Agent.

NEW JERSEY RAILROAD—For PHILADELPHIA.

Via Kensington, *6.30 p. m.; on Sundays, via West Philadelphia.

Via Camden, 1 p. m. and 4 p. m.

Via West Philadelphia, 7 a. m., 8.40 a. m., 10 a. m., 12.30 p. m., 5 p. m., *9 p. m., 9.20 p. m., and 12 night.

For Baltimore and Washington—8.40 a. m., 12.30 p. m., *9.26 p. m.

For South and Southwest—8.40 a. m., and *9.20 p. m.

FOR THE WEST.

8.40 a. m., 12.30 p. m., 5 p. m., *9 p. m. and *9.20 p. m. The 8.40 a. m., and *9 p. m. trains through, with but one change, to Cincinnati and Chicago.

Silver Palace Sleeping Cars attached to the 5 p. m. train run through to Cincinnati and Chicago without change, daily, (Saturdays and Sundays excepted); and on those days to the 9 p. m. train. This is the only line running through cars to Chicago by evening lines.

TICKET OFFICE FOOT OF CORTLANDT ST.

Tickets for sale in Reclining Chair cars can be obtained at foot of Courtland street and 944 Broadway.

May 10th, 1869. F. W. JACKSON,
*Daily. General Superintendent.

STEAMBOATS.

FOR BOSTON
VIA
FALL RIVER DIRECT.
The world-renowned steamers
BRISTOL AND PROVIDENCE,
Commander BRAYTON, Commander SIMMONS,
will leave (alternate days) DAILY
From Pier No. 30 North River,
foot of Chambers-st.,
AT FIVE P. M.
DODWORTH'S CELEBRATED ORCHESTRA.
GRAND PROMENADE CONCERT EVERY EVENING.
This is the only line running a
SUNDAY NIGHT BOAT.

To better accommodate the public the splendid steamers
NEWPORT AND OLD COLONY.
Commander LEWIS, Commander MILLER,
will leave (alternate days) DAILY
(Sundays excepted)
from Pier No. 28 North River,
(foot of Murray-st.,)
AT 6 P. M., FOR BOSTON VIA NEWPORT.
FREIGHT received at Pier No. 30 up to 5 P. M.
and at Pier No. 28 up to 6 P. M. each evening.
JAMES FISK, Jr., President.
M. R. SIMMONS, Managing Director,
CHAS. H. VAILE, General Passenger Agent,
H. H. MANGAM, Freight Agent.
Narragansett Steamship Company.

PEOPLE'S LINE FOR ALBANY.

—THE largest and most magnificent river steamers in the world—The ST. JOHN, DREW and DEAN RICHMOND.

One of the above steamers will leave Pier No. 41, North River, EVERY AFTERNOON (Sundays excepted) at 6 o'clock, arriving at Albany in time to connect with railroad trains West and North. Returning, leave the Albany Steamboat Landing at 7 o'clock P. M., or on the arrival of connecting trains from the West and North. Through tickets can be obtained at the office on the wharf, and baggage checked to its destination. Freight received until the hour of departure.

TROY LINE FOR ALBANY AND TROY.

The fastest, elegant evening river steamboats in the world.

The
VANDERBILT and CONNECTICUT
leaves Pier No. 44 North River, foot of Spring street,
EVERY EVENING,
Saturdays excepted, at 6 o'clock, and foot of West 34th street at 6:15. Fare only $1 50, being $1 75 less than rail and 75c. cheaper than any other route, and like reduction to Buffalo, Niagara Falls, all points West, to Saratoga, Sharon, Lake George, all points on Lake Champlain, to all points in Vermont and Western Massachusetts. Tickets sold and state-rooms secured at Dodd's Express Offices, Nos. 429 and 944 Broadway, New York, and No. 1 Court street, Brooklyn. Also at No. 308 West street, above Spring street. Passengers landed in Saratoga in time for breakfast.

STONINGTON LINE—TO BOSTON AND PROVIDENCE.

GREAT INSIDE ROUTE—SHORTEST AND MOST DIRECT.
Fare always as low as by any other line.

The new and elegant side-wheel steamers
STONINGTON and NARRAGANSETT,
Capt. WM. M. JONES. Capt. GEO. B. HULL.
From Pier No. 33, foot of Jay st., North River,
at 5 p. m.,
Arriving ahead of all other lines.
Tickets sold and state-rooms secured at No. 2 Astor House, and at Dodd's Express office, No. 944 Broadway.
D. S. BABCOCK,
President Stonington Steamboat Company.

ALBANY AND TROY DAY LINE.

—CHANGE OF TIME.

The steamboats
C. VIBBARD and DANIEL DREW
will, on and after THURSDAY, July 8, leave Desbrosses street at 8, and 34th street at 8:15, lancing at Yonkers, West Point, Cornwall, Newburg, Poughkeepsie, Tivoli, Rhinebeck, Catskill and Hudson. Tickets sold and baggage checked on board the boats to all points on New York Central and Rensselaer and Saratoga Railroads.

PUBLICATIONS.

THE MINES OF COLORADO:

BY CVANDO J. HOLLISTER.
LATE EDITOR AND PROPRIETOR OF
"THE COLORADO MINING JOURNAL."

The approaching completion of two lines of railway between the Mississippi Valley and the Rocky Mountains, will mark an era in the history of the nearer of the mining Territories—Colorado. It will infuse new life into mining, by giving safe, quick, and reliable communication, reducing freights and risks, thus cheapening supplies and furnishing a most necessary competition in the labor market, under which the production of the precious metals will be largely increased, and the value and importance of property of all kinds will be proportionally enhanced. This cannot fail to arrest the attention of capitalists who are interested in Colorado gold and silver stocks, or are thinking of becoming so. It will be of yet more benefit to that large class whose capital is their muscle, because it will make accessible to them a new and large tract of virgin land, which, though far West, is still on the World's great highway, and therefore in no sense of the word in the backwoods. This region has a pleasant and healthy climate, and while its soil is unsurpassed in strength by that of the prairie States, it has a superior market in the adjoining mines. It most eloquently invites settlement and improvement. It will also give the Summer tourist a choice between the West and the East. It is not hazarding much to say that the Rocky Mountains offer the most delightful Summer resort of the New if not of the Old World. The climate is cool and bracing, the air deliciously pure and soft, the scenery both grand and beautiful, the forests full of game and the streams of trout, with hot mineral springs of high medicinal value boiling up at the root of every shade tree in the sequestered parks. The annexation of the Rocky Mountains to the Union by railways will open a new world to science, a new field of adventure to money and muscle, a new and pleasant place of Summer resort to people of leisure.

To meet the growing want of definite information concerning that interesting country, this book is put forth. It treats of the discovery of gold and settlement of the country, its geography, chorography, geology mineralogy, and agriculture, its early efforts at self government, and the progress and present condition of mining industry, including descriptive list of mining companies, principal improved mines, mills, machinery, and methods of treating ore—in short, it undertakes to give, as concisely and precisely as possible, and without any pretension, all that is known on the subject.

CONTENTS:

CHAPTER I. *Page.*

Glance at Pike's Peak prior to the Discovery of Gold; Discovery of Gold on Ralston Creek in 1852, and on Dry Creek in 1858; Effect of the News in the States; Crossing the Plains; Indians; First View of the Mountains; Prospecting, Hunting; Placer Camp; Auraria; Arapahoe County; Election of Delegate to Congress and Representative to Kansas Legislature: Denver Town Company..... 1

CHAPTER II.

Grand Physical Divisions of Colorado; The Snowy Range, the Foot-hills, The Valley, and Over the Range; Characteristics of the Snowy Range, of the Foot-hills; The Great Mineral Belt; Metalliferous Veins; Mode of Occurrence of Gold—— 22

CHAPTER III.

Discoveries of Gold in the Mountains; John H. Gregory and the Gregory Lode; History of Discovery Claim on the Gregory; Placer and Bar Diggings; First Mining Laws; Russell Gulch; Quartz Mining; Gregory District Organized, and Code of Laws Adopted..... 59

CHAPTER IV.

Visit of Horace Greeley and Party; Establishment of Newspapers; Attempted Organization of Government; Jefferson Territory; Mail, Passenger, and Express Facilities: Overland Mail; First Winter in the Mines; Quartz Mills; Wagon Roads..... 83

CHAPTER V.

Development of Mining through 1860-1-2-3; Opening Prospects; Immigration and Emigration; Quartz Mining and Milling; Difficulty in Saving the Gold; Placer Mining; Organization of the Territory of Colorado by Congress; Mining Legislation; Miscellaneous..... 106

CHAPTER VI.

Condition of the Mines at the end of 1863; Transferred to Eastern Capitalists; The April (1864) Panic in Stocks; Temptation to Speculation in Gold Mining; Why the Miners were generally embarrassed at the end of 1863; Why the Eastern Mining Companies have been comparatively Unsuccessful..... 131

CHAPTER VII.

Gilpin County; Present Condition of the Improved Lodes; Names of Mining Companies; Amount of Development; Condition of Mines and Mills; Machinery; Processes, &c..... 141

CHAPTER VIII.

Gilpin County continued; Swinging Round the Circle; Independent, South Boulder, Central, Wisconsin Districts; Peck and Missouri Gulches; Their Improved Mines, Mills, Companies, Processes, &c..... 214

CHAPTER IX.

Clear Creek County; General Characteristics; Idaho; Empire: The Mines of Idaho; Spanish Bar; Trail Run; Tall River; Morris and Downieville Districts; Empire Mines; Griffith and Argentine Districts; Discovery, Development, and Richness of the Silver Mines..... 227

CHAPTER X.

Boulder County: Characteristics; Mining Districts, Gold Hill, Ward, Central; Boulder Valley, Boulder City, Valmont; Geology and Topography of the Coal and Iron Region; Bellemonte Furnace and Coal Beds; Black Hawk Foundry..... 263

CHAPTER XI.

Park County; South Park: Towns and Mines; Salt Works; Geology; Placer Mining in the Past, in the Present; Beaver Gulch; Tarryall; Crossing the Range in Mid-Winter; Lode Mining in the Past, in the Present; Climate; The Espinosas; The Reynolds Guerilla Raid..... 280

CHAPTER XII.

Lake County; Its Characteristics, Settlements; Arkansas River; Mining Districts; Westphalian, Pine Creek, La Plata, Georgia Bar, Hope, Lake Falls, Red Mountain, Arkansas, Independent, California, and Sacramento; Approaches..... 306

CHAPTER XIII.

Summit County; Middle Park; Upper Blue River; Ten-mile District; Result of Assays; Work doing; The Snakes; Peru and Montezuma Districts; Lodes and Companies and Improvements Going on; Gulch Mining, Union District, Gold Run and Buffalo Flats; Western Portion of the County..... 321

CHAPTER XIV.

Processes; The Stamp Mill, In Australia; Lake Superior, Copper Mines, California, Nevada, Colorado; Improvements; Keith's Desulpherizer, Crosby & Thompson's, Mason's, Mosnier Metallurgical Process; Smelting, James E. Lyon & Co.; Making of Regulus, &c..... 338

CHAPTER XV.

Important Mining Legislation..... 359

CHAPTER XVI.

Geology and Geological History..... 375

CHAPTER XVII.

Agriculture; The Valley, &c..... 416

CHAPTER XVIII.

Recapitulation; Mills and Mining Machinery..... 432

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THE success which has attended our efforts to provide a first-class Monthly, devoted to the interests of the industrial classes, has far exceeded our most sanguine anticipations. THE MANUFACTURER AND BUILDER has been received with favor by every class of the community. Manufacturers have taken it for the information which it gives in regard to the improved processes in which they are interested; mechanics have taken it for the instruction which it conveys in regard to matters pertaining to special arts and trades; professional and literary men have taken it for the information which it conveys in regard to the progress of the industrial arts; people, in general, have taken it because it contains much pleasant reading matter for the family circle. That all these classes have been right in their estimate of this journal, will be evident to any one who will read the Table of Contents which we here append. When we state that these articles are almost all derived from original and authoritative sources, it will be seen that we have presented a body of **PRACTICAL, THOROUGH, AND RELIABLE INFORMATION,** such as can nowhere else be obtained for the sum charged for a year's subscription to THE MANUFACTURER AND BUILDER.

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Table of Contents of the First Half-Volume of "The Manufacturer and Builder,"

[ILLUSTRATED ARTICLES ARE MARKED WITH AN ASTERISK.]

JANUARY.

*Gold and Stock Telegraphy, ... 1
Persian Arms, Damask Steel, and Damaskeening, ... 2
How to cause a Tempest in a Teapot, ... 2
The Causes of the Difference in the Color of Bricks, ... 3
How to make different Cements, ... 3
Learned Blacksmiths, ... 3
*Dove-Tail Joints, ... 4
Wall-damp, ... 5
The Utilization of Tin Scraps, ... 6
The Firmness of Paper, ... 6
New City Buildings, ... 7
*Have you ever looked through a Microscope? 8
The Mechanic and his Work, ... 8
Reversible Seats, ... 9
Preventive of the Decay of Wood, ... 9
Colorado Manufactures, ... 9
Chemical Engineering, ... 10
The New Art of Fresco-Painting, ... 10
"Old Says" on Building, ... 11
The Progress of Building, ... 11
Chrome-Yellow Paint, ... 11
*Hints for Sign-Painters, ... 12
Imitation-Marble, ... 13
Common Mortar, ... 13
New Paint for Floors, ... 13
Apatite; Its Importance in Domestic Economy, ... 14
Gun-Cotton, ... 14
The Preservation of Wood by Immersion, ... 14
Ventilation and Heating by Currents, ... 15
Cement and Mortar of the Ancients, ... 15
Bridging the Missouri, ... 16
*The Park Bank Building—A Palace of Finance, ... 17
The Air in Lecture and School-Rooms, ... 18
Glass, ... 19
Prize Problems, ... 19
Hoosac Tunnel, ... 21
*Deep-Sea Cables, ... 22
An Important Invention, ... 22
To the Public, ... 22
Trades' Unions in the United States, ... 23
Literary, ... 23
Mechanics' Homes, ... 24
*Long Island Villa, with Mansard Roof, ... 24
*Villa Cornice Work, ... 25
Children's Toys, ... 25
To the Press, ... 26
Occupations and Wages in California, ... 26
Queries, ... 27
Special Notice to Travellers, ... 27
Advertisements, ... 27

FEBRUARY.

*Portable Wainscoting, ... 33
Ventilation and Warming, ... 34
A Few Words about Bricks, ... 35
*The Bessemer Process and its Late Improvements, ... 35
Wire-Rope, ... 37
Hollow Walls, ... 39
Rock-Drilling Machine, ... 39
Mr. Mudge on Woolen Manufactures, ... 39
*Water-Proofing Dress Goods, ... 40
Insoluble Cements, ... 40
Atmospheric Action on Building-Stones, ... 40
*Anatomy of the Screw, ... 41
Lead Pencils, ... 41
Artificial Light and the Subject of Ventilation, ... 42
Architecture and Civilization, ... 43
Arches—Old and New, ... 43
*Manufacture of Sheet Tin, ... 44
Rates of Travel, ... 44
*Hand-Power Machine, ... 45
The History of Windows, ... 45
To Restore Burnt Cast-Steel, ... 45
To Bleach Palm-Oil, ... 45
The Building-Stone and Slate of Virginia, ... 46
The New-York Milling Interest, ... 47
*The New-City Post-Office, ... 48
Review of City Buildings, ... 50
Decay of Wood and Processes for Preserving it, ... 51
The Daguerrean Process, ... 51
To obtain Different Shades of Chrome-Yellow, ... 53
*Improved Cupola and Blower, ... 53
Literary, ... 54
Real Estate for Workingmen, ... 55
The Philosophy of Building, ... 55
*Villa and Cottage Architecture, ... 56
Consumption of Milk, ... 57
Trades and Professions, ... 58
Bread-Making, ... 58
Castle-Garden, ... 58
Queries, ... 59
Special Notice to Travellers, ... 59
Advertisements, ... 59

MARCH.

*Brick-Making, ... 65
Absorbent Capacity of Bricks, ... 66
Lake Colors—their Nature and Manufacture, ... 67
*Steam-Dredging and the Suez Canal, ... 68
The Selection of Wall-Paper, ... 71
*Marble Paper Manufacture, ... 71
Sand-Grinding Machine, ... 73
*The Gothic Furnace, ... 74
Ventilation and Heating by Currents, ... 74
*The Ventilation and Warming of School-Houses, ... 75
*Iron Buildings, ... 76
Hints on Economic Building, ... 78
Copper and its Alloys, ... 79
Cryolite—Where found, Nature, and Uses, ... 80
Chrome-Orange, ... 80
*Illinois State Capitol Design, ... 80
The Uses of Gun-Cotton, ... 82
Terra Cotta, ... 82
Building-Stones—Their Preservation, ... 82
*The Vermont Slate Industry, ... 83
Literary, ... 86
"Too Many Irons in the Fire," 87
The Tinning and Silvering of Looking-Glasses, ... 87
*French Sash-Windows, ... 88
*Whence Came our Silks? 88
*Cottage and Villa Architecture, ... 89
What Shall Workingmen Read? 90
The Dwarf Builders, ... 90
Nature as a Builder, ... 91
Sharpening Files by Corrosion, ... 92
Queries, ... 92
Special Notices, ... 92
Advertisements, ... 92

APRIL.

*Improvement in Hand-Drills, ... 97
Renovating Silk Hats, ... 97
Memoranda concerning Nails, ... 98
Comparative Weight of Pattern and Castings, ... 98
Flint-Glass, ... 98
Wolfram or Tungsten Steel, ... 99
Cheap Brick Walls, ... 99
*Stereotyping, ... 99
Edge-Tools, ... 102
Road-Dust and Vegetation, ... 102
Aniline Colors, ... 102
Soap-Making in the Olden Time, ... 103
*Manufacture of Vinegar, ... 104
Textile Fabrics from Glass, ... 104
The Effect of Artificial Light upon the Eyes, ... 105
*The Daguerrean Process, ... 105
Building in California, ... 105
The Piano-Forte, ... 106
The Art of Gilding, ... 106
Ventilation and Warming, ... 107
*Ventilation and Warming of School-Houses, ... 108
*The New-York Fire-Place Heater, ... 109
Cheap Houses—Building on Piece, ... 110
Economic Furniture, ... 111
The Manufacture of Cases for Percussion-Caps, ... 111
*The Thames Embankment, ... 112
*Automatic Indicator for Water and Steam, ... 115
*Winds and Chimney Draughts, ... 115
*Improved Electric Fuse, ... 116
*Stone-Breaking and Ore-Crushing, ... 117
Literary, ... 118
Are Men Equal? 119
Beauty in the Household, ... 119
Coöperation, ... 120
Irish Moss, ... 121
*Cottage and Villa Architecture, ... 121
Public Baths, ... 121
Manufacture of Brushes, ... 122
A Large Building, ... 122
To Clean Glass, ... 122
How to Make the Pearsley Cement, ... 122
Polytechnic Association of the American Institute, ... 122
Manufacturer and Builder at $1.50 per year—How it is Done, 122
Large Cash Premiums, ... 123
Queries, ... 123

MAY.

*The Telephone, ... 129
Peroxide of Hydrogen for the the Hair, ... 130
The Daguerrean Process, ... 130
Glue, ... 130
How to put a Cross-cut Saw in Order, ... 131
Coraline Dye—Injurious Effects Therefrom, ... 131
Mixing Things Up, ... 131
*On Boiler Explosions, ... 132
How to Repair Chain Pumps, ... 134
New Element, ... 134
*Béton Building, ... 135
Hydraulic Mortar, ... 135
Shellac for Water-Proof Coatings, Dyes, Paints, and Printing Inks, ... 136
*Improvement in Billiard Tables, ... 137
Historical Notes on Paper Manufacture, ... 137
Kalsomining Walls, ... 138
A Plea for Stone, ... 138
On Forging, Hardening, and Tempering Mill-Picks, ... 139
Chrome-Yellow Paint Practically Tested, ... 138
*Water-Closets, ... 140
Welding Copper, ... 140
The Largest Suspension Bridge, 140
*Improved Hoisting Apparatus, ... 141
Colored Marbles, ... 141
The Piano-Forte, ... 142
Thames Embankment—South side, ... 142
Seaweed Charcoal, ... 142
Ventilation and Warming, ... 143
The New Metal Hydrogenium, ... 144
Painting Zinc, ... 144
Artificial Alizarine for Coloring, ... 144
Priscian a little Scratched, ... 144
Suez Canal, ... 144
*The New State Emigrant Hospital, Ward's Island, ... 145
Magenta, ... 145
Varnishes for Iron, ... 147
Ornamental Glass—Opaline and Enamel, ... 147
Ship-Building—Here and in England, ... 147
Industrial Progress, ... 147
A New Ornamental Wood, ... 148
Sprinkling Streets with Deliquescent Salts, ... 148
*Old and New Fire-Grates, ... 148
Effect of Cold upon Tin, ... 148
Cryolite as a Source of Soda, ... 149
Literary, ... 150
Credit, ... 151
On Going Surety, ... 151
Interior Decorations, ... 151
*Church Architecture, ... 152
*Ornamental Work—Ceiling and Railing, ... 153
Purifying Water, ... 154
Adulterations, ... 154
Indelible Inks, ... 154
New Cements, ... 154
Welding Steel to Iron, ... 154
Queries, ... 155
New Advertisements, etc., ... 1??

JUNE.

*Improved Steam Pump, ... 161
What Paint shall we use? 162
Varnishes—their Nature and Manufacture, ... 162
Something of practical Importance in the Use of Plaster-of-Paris, ... 163
Influence of Water in the Manufacture of Wax-Leather, ... 163
Why do we Oil our Whetstones? 163
Compressed Leather, ... 163
*The Art of Electrotyping, ... 164
Practical Hints on Working and Tempering Steel, ... 166
Spiritual Photographs, ... 167
"Too Much Pork for a Shilling," 167
Credit to whom Credit, etc., ... 167
Store-Shutters, ... 168
Damp Cellars, ... 168
The Velocipede as a Mechanical Agent, ... 168
Calculating Areas by Weight, ... 168
Aniline Gray, ... 168
The Generation of Oxygen Gas from Sulphuric Acid, ... 168
*On Testing Iron by Magnetism, 169
Blowing a Wine-Glass, ... 169
How Jewelry is Made, ... 170
American Wheels, ... 170
Ventilation and Warming, ... 171
The Manufacture of Pins, ... 171
Right-Handand Left-Hand Locks 171
Lisieux and its Linen Factories, 171
Cleaning Gilded Ware, ... 171
Encaustic Tiles, ... 172
*Salt—its Manufacture and Uses, 172
Paper Belting, ... 173
Vegetable Oils—their Production and Purification, ... 174
Chimneys and Chimney-Shafts, .174
Artificial Stone, ...
Plank Walls for Cottages, ...
New Fact in the Behavior of Iron, ... 175
Science and Art, ... 175
*The Kansas City Bridge, ... 176
Cement to resist Red Heat and Boiling Water, ... 178
Recovery of Fatty Matter from Waste Soap-Waters, ... 179
Paper Houses, ... 179
Sodium as a Substitute for Phosphorus in Lucifer Matches, ... 1?
A Plea for Iron, ... 1?
To Keep Nails from Rusting, ... 1?
*Wrought-Iron Arch Girder Bridge, ... 18?
Liquid Fuel, ... 181
New Mode of Breaking Masses of Iron, ... 181
Utilization of Street Dust, ... 181
Literary, ... 182
How to Spoil a Husband, ... 183
Chess, ... 183
A New Alloy, ... 184
*A Country or Suburban Barn, ... 184
A New Material for Bonnets, ... 185
*Design for a Summer House, ... 185
Workingmen as Students, ... 185
Eating, ... 185
The Philosophy of a Candle, ... 186
Adulterations, ... 187
Recipes for Earthern-Ware Glazing, ... 187
Hemp, ... 187
A Poor Prospect for the Year 1900, ... 187
Setting Fence-Posts, ... 187
Queries, ... 187
New Advertisements, ... 188

The above speaks for itself. In a period of six months we gave upwards of **500 COLUMNS OF MATTER,** from the pens of the best writers in the country and presented in connection therewith upwards of **150 ENGRAVINGS!** The second half volume is equal to the first half in every respect, and it is our determination, during **1870,** to even surpass all our former efforts and make the MANUFACTURER AND BUILDER **INDISPENSABLE** to every

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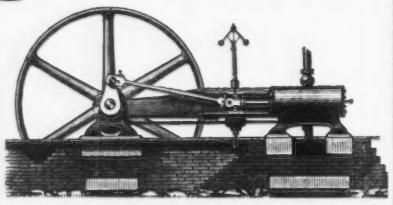

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